Journal of Contemporary Management
Volume 12

Finding theoretical evidence to justify the outsourcing of reverse logistics

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Abstract
Reverse logistics costs add seven to ten per cent of the total cost of goods sold and it is three times more expensive to process the return logistics costs than forward logistics costs. In recent years, with increasing environmental awareness and cost pressure, businesses and supply chains are becoming more aware of the importance of reverse logistics.
An in-depth study of reverse logistics has revealed that reverse logistics is a complex process with numerous problems and challenges. Many organisations are not prepared to do or do not have the necessary knowledge to deal with reverse logistics. As a continuation of the in-depth study and by means of a literature study this article explores the possibility of outsourcing of the reverse logistics process to third party logistics providers to alleviate the problem of managing the function internally.
It can be concluded that outsourcing to third-party reverse logistics providers is indeed a means in which organisations and supply chains can overcome numerous problems and challenges in reverse logistics. The findings of this study are presented in a conceptual framework that may serve as a guide for further empirical studies and managers who are considering the outsource decision for the reverse logistics function.

Key phrases
outsourcing, product returns, reverse logistics, third-party reverse logistics providers

1. INTRODUCTION

In the 21st century reverse logistics has increasingly become an important economic activity (Wang & Zhang 2009:2060). In recent years, evolving financial and competitive pressure, increasingly demanding customers and complex environmental regulations have elevated

the importance of sustainable supply chains and reverse logistics activities (Jain 2012:1239; Kaynak, Koçoğlu & Akgün 2014:438).

The increasing attention paid to reverse logistics originates not only from the reinforcement of environmental awareness and legislation, but also from the fact that reverse logistics activities have proved to be profitable in many industries (Kannan, Pokharel & Kumar 2009b:28; Pinna & Carrus 2012:91). Therefore, many organisations realise that sustainable supply chain management and reverse logistics are important factors for increasing quality and profitability (Jain 2012:1239).

Reverse logistics is essentially the opposite of logistics. The Council of Supply Chain Management Professionals (CSCMP 2010:144) defines logistics as

"[the] process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including service, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements".

Therefore, reverse logistics denotes a set of planning, execution and flow control measures for raw materials and finished products in order to recover and recycle those products or materials. It involves a whole range of activities, including collection, sorting, processing and reconditioning (BearingPoint 2008:27). In other words, reverse logistics is the backward flow of goods and information with an objective to reuse, remanufacture and recycle useful components, energy content or the product as a whole, and it links the physical movement of all recovered materials from the customer to the supplier (Mishra & Napier 2014:34).

In contrast to forward logistics studies, the topic of reverse logistics is not a popular research area in supply chain management (SCM) and logistics. However it has lately gained some attention from academics and practitioners (Pinna & Carrus 2012:91; Srivastava 2013:76; Zaarour, Melachrinoudis, Solomon & Min 2014:37).

2. BACKGROUND

Despite the growing recognition of the importance of reverse logistics, many organisations are not prepared to meet the challenges involved in handling returns (Srivastava 2013:67). Reverse logistics is complex because of the diversity of the areas it encompasses (Corrêa & Xavier 2013:8) and there are numerous barriers that make it difficult to have efficient and effective reverse logistics processes in place (Ravi & Shankar 2005:1026). This situation can

prevent organisations from implementing reverse logistics processes or systems (Srivastava 2013:65).

Therefore, it is becoming an increasing trend for organisations to outsource part of or all of their reverse logistics activities, since third-party reverse logistics (3PRL) providers are in many cases better equipped and are more efficient in managing the reverse logistics function than what the organisation could do on their own (Ravi 2012:26).

An in-depth study conducted in 2013 indicated that reverse logistics is complex, challenging and that it poses management problems to businesses and supply chains in South Africa (Badenhorst 2013). The purpose of the article is to explore, by means of a literature study, the option of outsourcing of the reverse logistics process as a potential solution to the problem. In addition, a conceptual framework will be compiled based on the literature findings that may serve as a guide to researchers for further research and a reference to managers while considering the insource/outsource decision of the reverse logistics process.

This article is structured as follows: firstly, an overview of the concept of reverse logistics is provided, which is followed by a discussion of the problems associated with the management of reverse logistics. Then a brief description of the research method is provided. The literature is then explored in order to determine the potential of outsourcing as a solution to reverse logistics problems. Finally, the conceptual framework for outsourcing as a solution to overcoming problems regarding the management of reverse logistics is presented, before the conclusion is drawn.

3. OVERVIEW OF REVERSE LOGISTICS

3.1 Description of reverse logistics

Reverse logistics is the process of planning, implementing and controlling the efficient and cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of expenditure or consumption to the point of origin, with the aim of recapturing value through proper disposal (Azadi & Saen 2011:12231; Rogers & Tibben-Lembke 1998:268).

The reverse logistics process includes activities such as product collection, inspection, separation and sorting, recovery and disposition (De Brito 2003:11; Hugo, Badenhorst-Weiss & Van Biljon 2004:228; Le Blanc 2006:11; PricewaterhouseCooper [PWC] 2008:16; Yimsiri 2009:6). Collection entails the collection of used products, making them available and moving them physically to some point where further treatment ensues (De Brito 2003:11;

Hugo *et al.* 2004:228; PWC 2008:16; Yimsiri 2009:6). After collection, the products need to be classified according to quality and composition in order to determine their route in the reverse chain (Le Blanc 2006:11; PWC 2008:16).

The inspection, separation and sorting stages occur at the collection point where the products are inspected and sorted on the basis of their quality (Ji 2008:55; Wang, Zhou & Ren 2010:340). Recovery is the process of recovering value from the returned product, components and materials (Le Blanc 2006:12). Product disposition refers to the different ways organisations attempt to recover the costs of products that are being returned (Stock & Mulki 2009:38). These options are: return to the seller, reuse of the product (which includes resell, redistribution, salvage, repair, recondition and refurbish), remanufacturing, donation, recycling and disposal (which may involve either incineration or using as a landfill). Each of these activities and options are illustrated in Figure 1.

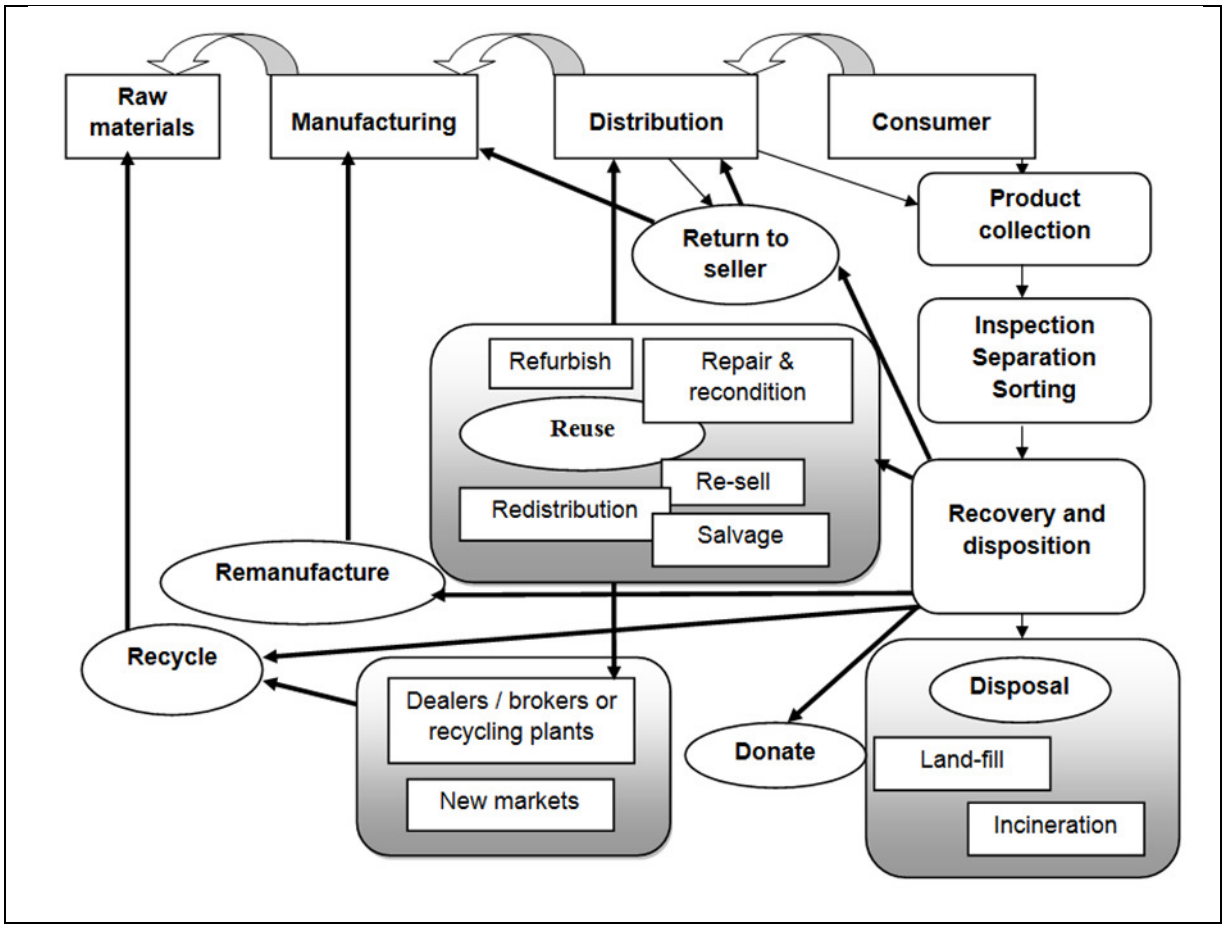

FIGURE 1: Reverse logistics activities and disposition options

Source: Authors' compilation

From Figure 1, it is clear that there are numerous activities and options that take place in the reverse logistics process and it links the physical movement of all recovered materials from the customer to the supplier (Mishra & Napier 2014:34). In its basic form, reverse logistics starts from the end users, where products are collected, and then attempts to manage returned products through different decision options (Govindan, Soleimani & Kannan 2015:603).

For example, a customer return a faulty printer to the retailer, the retailer will send the printer back to the manufacturer or a third-party that specialises in defective products. Before attempting to sell the printer in a defective condition, the manufacturer or third-party can decide on different options such as repair, recondition or remanufacture. On the other hand, if the returned product is beyond repair, another option can include recycling where the parts will move back through to the original supply chain. The many options and related activities in reverse logistics may be an important compounding factor regarding the difficulty of the management process.

3.2 Problems occurring in the management of reverse logistics

Reverse logistics pose many managerial problems for organisations and supply chains. These mainly include problems associated with costs, information systems, organisation and management and problems between supply chain partners.

3.3.1 Costs associated with reverse logistics

One of the main pressures that organisations face in reverse logistics is how to reduce costs (Pollock 2010:8). In a study, Deloitte Consulting (2014:3) found that an average of 7–10% of the cost of goods sold is directly or indirectly attributable to reverse logistics. According to the Reverse Logistics Executive Council (RLEC) in Norman and Sumner (2007:2), the increase in costs for processing returns is an astounding 200 – 300% in comparison to a forward sale.

It can therefore be said that it may cost three times more to process the reverse logistics of an item than it does to process the forward logistics to sell it. Reverse logistics cost is significant and on the rise (Carter & Ellram 1998:85; Pollock 2010:8). Reverse logistics is a nonrevenue-generating process which results in only a few resources allocated to this part of the supply chain (Biederman 2006:18; Rogers & Tibben-Lemke 2001:141; Shi & Zhihong 2010:444).

Most organisations are not aware of the current costs associated with reverse logistics because processes may be poorly defined and the systems may lack the necessary support (Moore 2006:10; UPS Consulting 2004:3; Walden 2005:1). Organisations may also find it difficult to estimate what the effect of reverse logistics expenses is on their margins, budgeting, liabilities and short- and long-term planning (Deloitte Consulting 2014:9).Therefore, reverse logistics has many hidden costs.

3.3.2 Information systems for reverse logistics

Information systems have been shown to play a role in reverse logistics (Harris & Martin 2014:7). Many organisations do not have the necessary information technology (IT) for developing an efficient and effective reverse logistics process (Srivastava 2013:65). The application of IT is the principal link in the reverse logistics system (Zheng, Zheng & Liu 2005:853). The information system is responsible for managing returns, communicating efficiently between the different parties involved, playing a role in identifying a product and deciding how to deal with it (Lambert, Riopel & Abdul-Kader 2011:563).

Therefore, a lack of information and technological systems can be a serious problem in terms of reverse logistics implementation (Jayaraman, Ross & Agarwal 2008:414; Ravi & Shankar 2005:1013). Various researchers found that information and logistics systems are not designed to make provision for reverse processes (Richey, Chen, Genchev & Daugherty 2005:830; Richardson 2006:2; Rogers & Tibben-Lembke 1998:43). Due to the absence of information technology there is a lack of information visibility and unpredictability (De Brito 2003:206; Rukavina in Walsh 2007:42; Rupnow 2011:35; Stock in Kuzeljevich 2004:36; Thrikutam & Kumar 2004:Internet).

3.3.3 Problems with product returns and reverse logistics processes

There is greater uncertainty in reverse logistics in comparison to forward logistics (Bai & Sarkis 2013:306). Reverse logistics processes are mainly more complicated due to the presence of multiple reverse distribution channels, individualised returns with small quantities, extended-order cycles associated with product exchanges and a variety of disposition options (Min & Ko 2008:177).

The reason for uncertainties in product returns is because reverse logistics occurs in a response to an action of the final consumer or a supply chain partner lower in the supply chain (Deloitte Consulting 2014:9). Therefore, organisations usually do not know what and how many products will be returned on a given day (Kussing & Pienaar 2009:429).

Product returns are therefore unplanned and uncertain in terms of timing, disposition, condition and the quality and quantity of returns (Pinna & Carrus 2012:93; Ravi 2012:25; Srivastava 2013:63). An appliance and electronics retailer, for example, do not know if there are any products that will be returned by final customers, how many and why.

Due to this unpredictable nature of product returns it is therefore more difficult to project return rates in reverse logistics flows than demand patterns in forward logistics flows (Zaarour *et al.* 2014:38). Consequently, organisations are finding that they must deal with a higher level of uncertainty (Kaynak *et al*. 2014:438).

3.3.4 Organisational and management-related problems

Organisations do not link reverse logistics to their competitive strategy (Harps 2003:Internet; Ravi & Shankar 2005:1017) and strategic planning of reverse logistics is a challenging problem due to various crucial issues (Srivastava 2013:69). The problems and difficulties associated with the planning, control and implementation of reverse logistics strategies and procedures can result in many mistakes and misperceptions on the part of the organisation (Rukavina in Walsh 2007:42; Starkowsky in Andel 2004:43; Stock 2001:1; Walker 2010:39).

Reverse logistics may be more difficult to manage due to the inexperience of most organisations (Bai & Sarkis 2013:306), and a major problem in the successful management of reverse logistics is the absence of an executive overseer to take responsibility for reverse logistics (Rukavina in Walsh 2007:42; Starkowsky in Andel 2004:43).

A possible reason for this may be that reverse logistics may not be the core activity of organisations (Islam, Abdul-Kader & Chaouch 2014:1936; Kannan *et al*. 2009b:28-29). As organisations develop core competencies in the fulfilment process, the core competency of reverse logistics may become too difficult to attain for the same organisation (Pinna & Carrus 2012:91). A main barrier in the successful implementation of reverse logistics is resistance to change (Kaynak *et al*. 2014:441). Resistance to change in the organisation can therefore be a problem because reverse logistics requires drastic changes in mind-set and practice (Ravi & Shankar 2005:1015).

3.3.5 Problems between supply chain partners

In the current business world, it has become difficult for organisations to be competitive without working in close collaboration with supply chain partners (Aguezzoul 2014:69). For reverse logistics to be successful, collaboration between supply chain partners is crucial

(Zheng *et al.* 2005:853). A lack of communication between partners can also be a source of risk (Breen 2006:54; Ravi & Shankar 2005:1017).

In conclusion, reverse logistics pose management problems due to the high and hidden costs, uncertainty, lack of technology, systems and visibility, multiple options and many activities involved.

4. RESEARCH METHOD

The main objective of the research and of this article is to explore literature regarding the outsourcing of reverse logistics as a possible solution to the challenge of managing reverse logistics. In addition, based on the literature, a conceptual framework is compiled to assist managers when considering the insource-outsource decision for reverse logistics. Therefore, an exploratory literature study was conducted.

Exploratory research often relies on secondary research such as reviewing available literature and/or data, or other qualitative approaches such as informal discussions with consumers, employees, management or competitors and more formal approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies (Saunders, Lewis & Thornhill 2003:97).

Exploratory studies are generally used when the area of investigation is new or vague and exploration is necessary (Burns & Burns 2008:82). Therefore, the goal is to improve the final research design by becoming familiar with basic facts, developing a picture of what the current situation entails, generating tentative assumptions and determining the feasibility of more rigorous follow-up research. Hence, exploratory studies tend to be mainly qualitative (Burns & Burns 2008:82).

Qualitative data can be obtained from many sources. In this article, secondary data collection was conducted. The types of secondary sources consulted in this study included:

- books, conference proceedings and reference materials;
- journal articles;
- online magazines and reports;
- theses and dissertations; and
- company and association websites.

Most of the sources were found by using the internet through search engines and electronic global databases. Owing to a lack of South African sources, the majority of the sources were

international sources. It is also necessary to point out that not all the sources that were consulted were based on scholarly work in the field of reverse logistics. The web pages of several companies and associations were consulted to gain a practical overview in the field of reverse logistics.

5. THE POTENTIAL OF OUTSOURCING AS A SOLUTION TO REVERSE LOGISTICS MANAGEMENT PROBLEMS

Reverse logistics is that part of the supply chain that is often outsourced to third party reverse logistics (3PRL) providers (Davis 2011:Internet). 3PRL providers offer reverse logistics as a value-added service to organisations wishing to outsource their reverse logistics processes and activities (Kannan 2009:399).

Many organisations that have benchmark supply chain functions outsource reverse logistics (Davis 2011:Internet). Reverse logistics is becoming an area of organisational competitive advantage and selecting a suitable 3PRL provider can decrease cost and management risk (Zhi-Hong & Qiang 2009:497). For that reason, 3PRL providers can become important players in various industries since they can participate in the cost reduction and improvement of service quality of customers (Senthil, Srirangacharyulu & Ramesh 2014:56).

Many organisations view the entire concept of reverse logistics as unmanageable, and choose to outsource their reverse logistics activities instead of attempting to manage the process themselves (Integrated Warehousing Solutions 2005:Internet). Fortunately, there are many organisations that specialise in reverse logistics and developed it as a core competency. Therefore, outsourcing of reverse logistics is rapidly becoming the preferred alternative option for organisations (Pinna & Carrus 2012:91).

According to Ordoobadi (2009:836), the main benefits or reasons for outsourcing fall into three categories, namely strategic, operational and financial reasons.

- *Strategic reasons* include the competencies of 3PRL providers, expansion to new markets, ability to focus on core activities, differentiation from competitors, gaining access to world-class technology and improving customer service.
- *Operational reasons* include operation flexibility, lack of internal expertise, and availability of more specialised logistics expertise, accommodating coordination needs, labour issues and handling of the non-value-added activities.

- *Financial reasons* include avoiding large investments, cost advantages due to economies of scale, reduction in operating and transaction costs, diverting capital investment/improving returns on assets and reduction in employee base (Ordoobadi 2009:836).

Each of these three categories will be discussed in terms of overcoming the various problems and challenges that organisations experience in reverse logistics.

5.1 Strategic reasons

Outsourcing reverse logistics function to 3PRL providers has been a resource of competitive advantage for most organisations (Azadi & Saen 2011:12231). One of the most important success factors for a benchmark reverse logistics programme is top management support, and the most successful top managers have the conviction of staying focused on their core competencies and outsourcing non-core processes to experts in the field (Doughton 2007:Internet).

Therefore, outsourcing reverse logistics will enable organisations to focus on their core business operations (Azadi & Saen 2011:12231; Senthil *et al.* 2014:51) leaving the rest to expert firms (Azadi & Saen 2011:12231). By outsourcing reverse logistics as a non-core function, organisations can gain efficiencies within their forward operations by clearing valuable warehouse space, maximising internal resources and managing risk associated with regulatory compliance for product disposition (Doughton 2007:Internet).

In today's business environment, the demand for IT resources far exceeds the budgeted supply, especially for processes that are not considered a core competency for the company (Doughton 2007:Internet). Consequently, 3PRL is playing an important role in supporting such integrated supply chain management using sophisticated information systems and dedicated equipment (Kannan 2009:399). These logistics providers generally have powerful forward logistics management systems which make it easier for them to develop successful, strong reverse logistics information modules. The combination of forward logistics and reverse logistics information systems will be more conducive to an overall effective information system (Meng, Zhang & Song 2009:632). The innovation that is brought from 3PRL providers can be an element of collaboration, influencing the whole of the supply chain market position (Grabara & Kot 2010:106).

The information systems and technology of 3PRL providers can also assist with problems in product returns. Organisations can utilise 3PRL provider's management information systems to track products, analyse reasons for product returns, improve product quality or use the

information to predict future trends (Wang & Zhang 2009:2062). 3PRL providers have the advanced technology which provides them with the capability to make quick response, flexibility and agility to the changing demand (Wang & Zhang 2009:2061). Therefore, uncertainty can be reduced due to the latest technology and resource-sharing advantages of 3PRL providers (Senthil *et al.* 2014:51).

5.2 Operational reasons

One of the primary reasons for outsourcing the returns of the supply chain to 3PRL providers is the latter's expertise, knowledge and experience in reverse logistics (Witt 2007:Internet). Many organisations outsource reverse logistics because they lack the expertise within their management ranks to run the reverse logistics process or they do not want to use resources on the function under consideration (Davis 2011:Internet). 3PRL providers can offer organisations the expertise that they lack in reverse logistics (Grabara & Kot 2010:106).

Therefore, reverse logistics is usually outsourced because there is no internal expertise and/or the organisation is unwilling to invest in the team and technology needed to improve reverse logistics (Davis 2011:Internet). 3PRL providers have the necessary expertise and a broader view of how reverse logistics works because they deal with multiple organisations and industries and they can leverage their knowledge and software capacity to benefit all members in the supply chain (Kaynak *et al.* 2014:440).

Outsourcing reverse logistics is often the best way to develop returns processing capabilities (Davis 2011:Internet). Organisations should consider making use of 3PRL providers since they are specialists who can execute a number of product disposition tasks efficiently and effectively (Rukavina in Walsh 2007:42). 3PRL providers can also increase the efficiency of operations (Haibo 2008:372). To manage uncertainties, flexibility needs to be built into the reverse logistics process (Bai & Sarkis 2013:307). Flexibility is one of the most efficient responses to the complexities and uncertainties in reverse logistics (Bai & Sarkis 2013:309). Therefore, organisations choose to outsource reverse logistics to achieve greater flexibility and faster turn-around speed to the market (Davis 2011:Internet).

5.3 Financial reasons

In addition to the overwhelming potential of outsourcing identified above, it also makes sense financially to outsource reverse logistics. Cost pressure continues to increase in the competitive logistics industry. A growing number of 3PRL providers have begun to explore the possibility of managing product returns in a more cost-efficient manner (Min & Ko

2008:176). Because of their expertise, 3PRL providers have the ability to cut costs and execute the processes of reverse logistics more efficiently (Cain 2008:15; Haibo 2008:372; Rukavina in Walsh 2007:42) and can help save the organisation money and time (Smith 2005:179).

One example of how outsourcing to 3PRL providers can overcome some challenges in reverse logistics, is the fact that of 80–90% of the returns of retail businesses in the United States have been managed efficiently by 3PRL providers through re-producing and optimising reverse process and information systems, which has resulted in a drop of 4% of total logistics cost (Wang & Zhang 2009:2060).

Furthermore, 3PRL providers also solve the problems of volumes. They can take advantage of economies of scale by converting reverse logistics functions into a profit-generating activity into the closed loop supply chain (Kannan, Murugesan, Senthil & Noorul Haq 2009a:164) and reducing the overall cost of reverse logistics (Kannan, Pokharel *et al.* 2009b:28-29). Therefore, the effective use of 3PRL providers for reverse logistics activities can lead to increased profit margins (Ravi 2012:26) and cost reductions due to economies of scale and expertise.

The multitude of reasons provided for outsourcing reverse logistics above can be summarised in terms of the following literature sources:

- The growth of outsourcing is mainly attributed to the benefits it brings in terms of reducing costs and operating risk, improving performance, focusing on core business (Aguezzoul 2014:69; Wang & Zhang 2009:2060), building virtual enterprises through strategic alliances (Aguezzoul 2014:69) and improving competitiveness in the supply chain (Wang & Zhang 2009:2060).
- 3PRL providers usually possess substantial operation experience, advanced management systems and technology and a comprehensive network (Wang & Zhang 2009:2061).
- The benefits of reverse logistics outsourcing include lower costs due to economies of scale, greater flexibility (Azadi & Saen 2011:12231; Islam *et al.* 2014:1937), higher quality of service, better budget control, improved risk management, lower ongoing investment in internal infrastructure (Islam *et al.* 2014:1937), operational efficiency and enhanced customer service levels (Azadi & Saen 2011:12231).

- Making use of 3PRL providers in a supply chain also allows for sustainability because reverse logistics services afford organisations the opportunity to increase their profit margins, differentiate their services from those of their competitors, attract new clients, experience the advantages of well-managed reverse logistics practices and improve their status in the global supply chain network (Efendigil, Önüt & Kongar 2008:270).

In conclusion, overwhelming evidence is prevalent in the literature in support of the use of outsourcing in order to alleviate the management problems in reverse logistics.

6. A CONCEPTUAL FRAMEWORK FOR THE OUTSOURCING OF REVERSE LOGISTICS

The main aim of this article is to explore the outsourcing of reverse logistics as a solution to overcome the problems of managing reverse logistics. In addition, the aim was to compile a conceptual framework that may assist researchers who wish to further study the subject and managers when they need to make outsourcing decisions. The framework, which is actually a summary of literature findings, contains a vast number of issues that are important in the outsourcing decision. In the framework presented in Table 1, the shortcomings or challenges that may be experienced in the reverse logistics channel are linked to the potential solutions that 3PRL providers can offer organisations and supply chains.

TABLE 1: Conceptual framework for outsourcing as a solution to overcoming reverse logistics management problems

Shortcomings or challenges in reverse logistics	Category	Possible solutions provided by 3PRL providers
High cost associated with reverse logistics	Financial	▪ Enables organisations to cut or decrease reverse logistic cost (Aguezzoul 2014:69; Cain 2008:15; Haibo 2008:372; Rukavinain in Walsh 2007:42; Sethil *et al.* 2014:56 Wang & Zhang 2009:2060; Zhi-Hong & Qiang 2009:497) ▪ Takes advantage of economies of scale to reduce the cost of reverse logistics and turning reverse logistics into a profit-generating activity (Islam *et al.* 2014:1937; Kannan *et al*. 2009b:164; Kannan *et al.* 2009b:28-29) ▪ Provides the opportunity to increase profit margins (Efendigil *et al.* 2008:270) ▪ More cost-efficient (Cain 2008:15; Haibo 2008:372; Min & Ko 2008:176; Rukavina in Walsh 2007:42) ▪ Improved budget control (Islam *et al.* 2014:1937) ▪ Lower investment in internal infrastructure (Islam *et al.* 2014:1937)

Shortcomings or challenges in reverse logistics	Category	Possible solutions provided by 3PRL providers
Information systems for reverse logistics • Inadequate infrastructure for IT solutions • Lack of information and technology systems • Lack of information visibility and capability	Strategic	▪ Uses sophisticated information systems (Kannan 2009:399) ▪ Has advanced technology (Wang & Zhang 2009:2061) ▪ Strong information system capabilities (Meng *et al.* 2009:632)
Problems with product returns and reverse logistics processes • Uncertainty of product returns • Time and money spent on determining the most suitable disposition option	Strategic	▪ Utilises information systems to track products, analyses reasons for product returns and improves product quality (Wang & Zhang 2009:2062) ▪ Uncertainties can be reduced due to latest technology and resource sharing advantages (Senthil *et al.* 2014:51).
	Operational	▪ Develops return processing capabilities (Davis 2011:Internet) ▪ Achieves greater flexibility and speed (Davis 2011:Internet) ▪ Reduces operating risk (Wang & Zhang 2009:2060) ▪ Experiences operational efficiency (Azadi & Saen 2011:12231; Haibo 2008:372) ▪ Specialist in product disposition (Rukavina in Walsh 2007:42) ▪ Improves flexibility (Azadi & Saen 2011:12231; Bai & Sarkis 2013:309)
	Financial	▪ Solves problems with volumes by taking advantage of economies of scales (Kannan *et al.* 2009a:164)
Organisational and management-related problems • Lack of strategic planning to include reverse logistics • Shortage of executive overseer for reverse logistics	Strategic	▪ Outsource non-core processes (Doughton 2007:Internet) ▪ Enables organisation to focus on or to strengthen its core competencies (Aguezzoul 2014:69; Azadi & Saen 2011:12231; Senthil et al. 2014:51; Wang & Zhang 2009:2060) ▪ Has advanced management system (Wang & Zhang 2009:2061)
• Lack of expertise and experience • Non-core capabilities • Resistance to change and the need for new approaches	Operational	▪ Has expertise, knowledge and experience in reverse logistics (Grabara & Kot 2010:106; Witt 2007:Internet) ▪ Substantial operating experience (Wang & Zhang 2009:2061) ▪ Experiences advantages of well-managed reverse logistics practices (Efendigil et al. 2008:270)

Shortcomings or challenges in reverse logistics	Category	Possible solutions provided by 3PRL providers
Problems between supply chain partners • Lack of collaboration • Lack of communication	Strategic	▪ Plays important role in supporting integrated supply chain management systems (Kannan 2009:399) ▪ Improves competitiveness of the supply chain (Azadi & Saen 2011:12231) ▪ Brings innovation to improve collaboration (Grabara & Kot 2010:106)

Source: Authors' compilation from literature

From the above framework it is clear that outsourcing of the reverse logistics process to 3PRL providers makes sense, for it offers the organisation and supply chain solutions to their reverse logistics problems, such as:

- cost-effectiveness through economies of scale;
- the availability of information technology to improve operational processes;
- providing expertise and enable organisations to concentrate on core business; and
- improving relations and efficiencies in the supply chain.

7. CONCLUSION

The management of reverse logistics is difficult due to high and hidden costs, uncertainty, lack of appropriate technology, systems and visibility, multiple options and many activities involved. This study explored the literature to discover evidence for the option to possibly outsource reverse logistics to 3PRL providers to alleviate the burden of managing reverse logistics internally. With this study evidence was found that there is a significant increase in the outsourcing of the reverse logistics function.

Outsourcing to 3PRL providers may benefit businesses and supply chains - strategically, operationally and financially. *Firstly*, strategic benefits may include the focus on core activities (due to outsourcing of non-core processes), access to world-class technology and information systems and improved collaboration and competitiveness in the supply chain. *Secondly*, operational benefits may include access to expertise, knowledge and experience in reverse logistics, improved flexibility, reduction of uncertainties and improved operational efficiencies. *Finally*, financial benefits may include the reduction of reverse logistics costs, economies of scale and improved profit margins.

The main contribution of this research and article lies in the conceptual framework presented in Table 1. The challenges or shortcomings experienced with the management of reverse logistics are linked to possible solutions that the outsourcing of the function to 3PRL providers may offer to a business or supply chain. The table or framework contains a fairly complete list of all the issues that needs to be considered regarding the outsourcing decision and can be used as a guide by managers to justify the outsourcing of reverse logistics.

Based on evidence presented in the literature, it is clear that outsourcing of reverse logistics can be justified as a potential solution in overcoming problems and challenges in reverse logistics. With this in mind, there are numerous opportunities for future research. This article is purely based on literature findings; therefore, further evidence of the viability and use of this option in the South African market through empirical research is needed. Consequently, the conceptual framework that was developed and reported on in this article could also serve as a basis for further research studies. The framework could also raise awareness of the potential of outsourcing in reverse logistics for organisations and supply chains.

REFERENCES

AGUEZZOUL A. 2014. Third-party logistics selection problem: a literature review on criteria and methods. *Omega* 49:69–78.

ANDEL T. 2004. How to advance in the reverse channel. *Material Handling Management* 59(2):24–31.

AZADI M & SAEN RF. 2011. A new chance-constrained data envelopment analysis for selecting third-party reverse logistics providers in the existence of dual-role factors. *Expert Systems with Applications* 38:12231–12236.

BADENHORST A. 2013**.** A best practice framework in reverse logistics. Pretoria: University of South Africa. (Unpublished MCom dissertation.)

BAI C & SARKIS J. 2013. Flexibility in reverse logistics: a framework and evaluation approach. *Journal of Cleaner Production* 47:306–318.

BEARINGPOINT. 2008. How mature is the green supply chain? 2008 Supply Chain Monitor. Insight – survey report. [Internet: http://www.escp-eap.eu/uploads/media/ Supply_Chain_Observatory_2008.pdf; downloaded on 2011-07-08.]

BIEDERMAN D. 2006. Planning for happy returns. *Traffic World* 270(36):18.

BREEN L. 2006. Give me back my empties or else! A preliminary analysis of customer compliance in reverse logistics practices (UK). *Management Research News* 29(9):532–551.

BURNS RB & BURNS RA. 2008. Business research methods and statistics using SPSS. London, UK: Sage.

CAIN R. 2008. Turning returns into revenue: why leaving your reverse logistics to the experts puts more cash into your pockets. *Reverse Logistics Magazine*. 11.3(3):12–15. [Internet: www.RLmagazine.com; downloaded on 2009-08-26.]

CARTER CR & ELLRAM L. 1998. Reverse logistics: a review of literature and framework for future investigation. *Journal of Business Logistics* 9(1):85–102.

CORRÊA HL & XAVIER LH. 2013. Concepts, design and implementation of reverse logistics systems for sustainable supply chains in Brazil. *Journal of Operations and Supply Chain Management* 6(1):1–25.

COUNCIL OF SUPPLY CHAIN MANAGEMENT PROFESSIONALS. 2010. Supply chain and logistics terms and glossary. [Internet: http://cscmp.org/digital/glossary/glossary.asp; downloaded on 2010-06-25.]

CSCMP see COUNCIL OF SUPPLY CHAIN MANAGEMENT PROFESSIONALS.

DAVIS G. 2011. Outsourcing reverse logistics. [Internet: http://grevedavis.com/2011/03/28/outsourcing-reverse-logistics/; downloaded on 2013-09-22.]

DE BRITO MP. 2003. Managing reverse logistics or reversing logistics management*?* Rotterdam, NL: Erasmus: University. (ERIM PhD Series Research in Management).

DELOITTE CONSULTING. 2014. The hidden value in reverse logistics. [Internet::http://www2.deloitte.com/content/dam/Deloitte/be/Documents/process-and-operations/BE_POV_Supply-chain-strategy_20140109.pdf; downloaded on 2014-07-27.]

DOUGHTON M. 2007. Being adept at forward logistics doesn't count in reverse logistics. SupplyChainBrain. [Internet: http://supplychainbrain.com; downloaded on 2013-09–22.]

EFENDIGIL H, ÖNÜT S & KONGAR E. 2008. A holistic approach for selecting a third-party reverse logistics provider in the presence of vagueness. *Computers and Industrial Engineering* 54(2):269–287.

GOVINDAN K, SOLEIMANI H & KANNAN D. 2015. Reverse logistics and closed-loop supply chain: a comprehensive review to explore the future. *European Journal of Operational Research* 240:603-626.

GRABARA J & KOT S. 2010. Business relations in reverse logistics outsourcing. *Economic Analysis* 43(1–2):99-107.

HAIBO Z. 2008. Modeling of the third party reverse logistics information system based on UML. Singapore: ICCSIT. (International Conference on Computer Science and Information Technology; 29 Aug – 2 Sep.)

HARPS LH. 2003. Revving up returns. Inbound Logistics. [Internet: http://www.Inboundlogistics.com/articles/features/1103_feature02.shtml; downloaded on 2007-10-05.]

HARRIS C & MARTIN KB. 2014. The reverse logistics of online retailing, its evolution and future directions. *Journal of System and Management Science* 4(2):1–14.

HUGO WMJ, BADENHORST-WEISS JA & VAN BILJON EHB. 2004. Supply chain management: logistics perspective. Pretoria: Van Schaik.

INTEGRATED WAREHOUSING SOLUTIONS. 2005. Gaining the competitive edge: achieving reverse logistics excellence. [Internet: www.irmswms.com; downloaded on 2007-09-04.]

ISLAM KJ, ABDUL-KADER W & CHAOUCH B. 2014. Outsourcing strategy in reverse logistics network: a Markov decision process and simulation approach. Bali. (International Conference on Industrial Engineering and Operations Management, 7 – 9 Jan).

JAIN V. 2012. Special issue on sustainable supply chain management and reverse logistics. *International Journal of Production Research* 50(5):1239–1242.

JAYARAMAN V, ROSS AD & AGARWAL A. 2008. Role of information technology and collaboration in reverse logistics supply chains. *International Journal of Logistics Research and Applications* 11(6):409–425.

JI G. 2008. Reverse logistics operation management based on virtual enterprises and complaint service management. *Journal of Service Science and Management* 1(1):51–66.

KANNAN G. 2009. Fuzzy approach for the selection of third party reverse logistics providers. *Asia Pacific Journal of Marketing and Logistics* 21(3):397–416.

KANNAN G, MURUGESAN P, SENTHIL P & NOURUL HAQ A. 2009a. Multi-criteria group decision making for the third party reverse logistics service provider in the supply chain model using Fuzzy TOPSIS for transportation services. *International Journal of Services Technology and Management* 11(2):162–181.

KANNAN G, POKHAREL S & KUMAR PS. 2009b. A hybrid approach using ISM and fuzzy TOPSIS for the selection of reverse logistics providers. *Resources, Conservation and Recycling* 54:28–36.

KAYNAK R, KOÇOĞLU Í & AKGÜN AE. 2014. The role of reverse logistics in the concept of logistics centers. Procedia Social and Behavioral Science (2nd World Conference on Business, Economics and Management; 8 Jan 109:438–442.)

KUSSING U & PIENAAR WJ. 2009. Business logistics management: a supply chain perspective. In PIENAAR WJ & VOGT JJ (eds). 3rd ed. South Africa: Oxford University Press.

LAMBERT S, RIOPEL D & ABDUL-KADER W. 2011. A reverse logistics decisions conceptual framework. *Computer and Industrial Engineering* 61(3):561-581.

KUZELJEVICH J. 2004. Targeting reverse logistics. *Canadian Transportation Logistics* 107(9):36–39.

LE BLANC HM. 2006. Closing loops in supply chain management: designing reverse supply chains for end-of-life vehicles. Tilburg, NL: Tilburg University. (PhD.)

MENG X, ZHANG Y & SONG W. 2009. Analysis on 3PRL and its provider selection. Wuhan: ESIAT. (International Conference on Environmental Science and Information Application Technology, 4–5 July).

MIN H & KO H. 2008. The dynamic design of a reverse logistics network from the perspective of third-party logistics service providers. *International Journal of Production Economics* 113:176–192.

MISHRA R & NAPIER R. 2014. Reverse logistics: antecedents of successful implementation and firm performance effects. *Journal of Supply Chain and Operations Management* 12(2):33–49.

MOORE J. 2006. Reverse logistics: the least used differentiator. *Reverse Logistics Magazine* 1(4):10–11. [Internet: www.RLmagazine.com; downloaded on 2007-09-05.]

NORMAN L & SUMNER W. 2007. Reverse logistics: the bearer of good fortune. Take supply chain news articles. [Internet: http://www.takesupplychain.com/news-article-11-30-07.php; downloaded on 2011-08-27.]

ORDOOBADI SM. 2009. Outsourcing reverse logistics and remanufacturing functions: a conceptual strategic model. *Management Review News* 32(9):831–845.

PINNA R & CARRUS PP. 2012. Reverse logistics and the role of fourth party logistics providers. In GROZNIK A (ed). Pathways to supply chain excellence. InTech. [Internet: http://www.intechopen.com/books/pathways-to-supply-chain-excellence/reverse-logistics-and-third-party-logistics-providers-capabilities, downloaded on 2014-01-05.]

POLLOCK WK. 2010. Driving return process directly to the bottom line. *Reverse Logistics Magazine.* 21th ed. 5(3):12–16. [Internet: www.RLmagazine.com; downloaded on 2010-04-22.]

PRICEWATERHOUSECOOPERS. 2008. Reverse logistics: how to realise an agile and efficient reverse chain within the consumer electronics industry. Integrated supply chain solutions. [Internet: http://www.pwc.nl/nl/publicaties/reverse-logistics.jhtml; downloaded on 2011-08-30].

PWC see PRICEWATERHOUSECOOPERS

RAVI V & SHANKAR R. 2005. Analysis of interactions among the barriers of reverse logistics. *Technological Forecasting & Social Changes* 72:1011–1029.

RAVI V. 2012. Selection of third-party reverse logistics providers for end-of-life computers using TOPSIS-AHP based approach. *International Journal of Logistics Systems and Management* 11(1):24–36.

RICHARDSON HL. 2006. Looking forward in reverse. *Logistics Today* 47(7):20–22.

RICHEY RG, CHEN H, GENCHEV SE & DAUGHERTY P. 2005. Developing effective reverse logistics programs. *Industrial Marketing Management* 34:830–840.

ROGERS DS & TIBBEN-LEMBKE RS. 1998. Going backwards: reverse logistics trends and practices. Reverse logistics executive council. E-book. [Internet: www.rlec.com; downloaded 2007-06-08.]

ROGERS DS & TIBBEN-LEMBKE RS. 2001. An examination of reverse logistics practices. *Journal of Business Logistics* 22(2):129–148.

RUPNOW P. 2011. Time for some reverse logistics software. *Reverse Logistics Magazine,* 34th ed. 6(8):35–36. [Internet: www.RLmagazine.com; downloaded on 2011-10-28.]

SAUNDERS M, LEWIS P & THORNHILL A. 2003. Research methods for business students. 3rd ed. Harlow, UK: Prentice Hall.

SENTHIL S, SRIRANGACHARYULU B & RAMESH A. 2014. A robust hybrid multi-criteria decision making methodology for contractor evaluation and selection in third-party reverse logistics. *Expert Systems with Applications* 41:50–58.

SHI Y & ZHIHONG M. 2010. Reconsidering supply chain management reverse logistics. Hangzhou, CH: ICISE. (2nd International Conference of Information Science and Engineering, 4–6 Dec).

SMITH AD. 2005. Reverse logistics programs: gauging their effects on CRM and online behaviour. *Journal of Information and Knowledge Management Systems* 35(3):166–181.

SRIVASTAVA SK. 2013. Issues and challenges in reverse logistics. In GUPTA SM (ed.) Reverse supply chains: Issues and analysis. Boca Raton, FL: CRC.

STOCK JR & MULKI JP. 2009. Product returns processing: an examination of practices of manufacturers, wholesalers/distributors, and retailers. *Journal of Business Logistics* 30(1):33–62.

STOCK JR. 2001. The 7 deadly sins of reverse logistics. *Material Handling Management* 56(3):1.

THRIKUTAM P & KUMAR S. 2004. Turning returns management into a competitive advantage in hi-tech manufacturing. Infosys Technologies. [Internet: http://www.mid-hudsonapics.org/LinkedDocuments/ Infosys_Returns_ Management_Hitech_Manufacturing.pdf; downloaded on 2011-07-18.]

UPS CONSULTING. 2004. Reverse logistics: the least used differentiator. UPS Consulting, White Paper: 1–10. [Internet: http://www.ups-scs.com/solutions/whitepapers3.html; downloaded on 2007-11-30.]

WALDEN JW. 2005. Reverse logistics: important or irritant. Supply Chain Advanced Network (SCAN). Honeycomb Connect. [Internet: http://www.honeycombconnect.com/Supply_Chain_Management/document_ 5567. ashx?page=Supply_Chain_Management_home&datasource=427; downloaded on 2008-02-27.]

WALKER K. 2010. Directing reverse logistics: a corporate paradigm shift. *Reverse Logistics Magazine*, 22nd ed. 5(4):38–40. [Internet: www.RLmagazine.com; downloaded on 2011-07-27.]

WALSH J. 2007. Reverse logistics and the total product life cycle. *Reverse Logistics Magazine,* 8-2(5):42–43. [Internet: www.RLmagazine.com; downloaded on 2008-02-12.]

WANG P, ZHOU G & REN J. 2010. Research on structure of reverse logistics network. Chengdu: ICLEM. (International Conference of Logistics Engineering and Management; 1(5):336–362.)

WANG S & ZHANG S. 2009. Benchmarking model for reverse logistics entry by third-party providers. Shenyang: ICAL. (IEEE International Conference on Automation and Logistics; 5–7 Aug.).

WITT CE. 2007. Forward thinking about reverse logistics. Material handling management. [Internet: http://mhlnews.com/facilities-management/forward-thinking-about-reverse-logistics; downloaded on 2011-06-05.]

YIMSIRI S. 2009. Designing multi-objective reverse logistics networks using genetic algorithms. Arlington, TX: The University of Texas. (PhD thesis.)

ZAAROUR N, MELACHRINOUDIS E, SOLOMON MM & MIN H. 2014. The optimal determination of the collection period for returned products in the sustainable supply chain. *International Journal of Logistics Research and Applications: A Leading Journal of Supply Chain Management* 17(1):35–45.

ZHENG Y, ZHENG W & LIU P. 2005. Research on information integration management of reverse logistics. New York, NY: ICEC. (7th International Conference on Electronic Commerce, 2005 133:851–855).

ZHI-HONG Y & QIANG L. 2009. The grey comprehensive evaluation model of a third-party reverse logistics provider selection. Hainan Island, CHI: JCAI. (International Joint Conference on Artificial Intelligence, 25–26 Apr.)