

СЕКЦІЯ 2
МАРКЕТИНГ І ЛОГІСТИКА
MARKETING AND LOGISTICS
SESSION 2

**Адаптивність до зворотної
ЛОГІСТИКИ**

Ганс-Крістіан Пфоль¹, Нгуєн Ті Ван Ха²

Факультет управління системами постачання
та мережами, Технологічний університет
м. Дармштадт, НІМЕЧЧИНА, вул. Гохшуле, 1,
E-mail: ¹pfohl@bwl.tu-darmstadt.de
²nguyen@bwl.tu-darmstadt.de

Зворотна логістика останнім часом набуває щораз більшої популярності з огляду на впровадження чинних законів, зростання потенціалу клієнтів, а також економічні переваги ліквідаційної вартості. Компанії застосовують зворотну логістику для забезпечення диференціації та зменшення витрат. Вони змінюють свої стратегії та узгоджують організацію, процеси й системи зі зворотною логістикою. Наша стаття зосереджується на вивченні здатності адаптації компаній до зворотної логістики в галузі побутової електротехніки в Європі у стратегічній перспективі.

Методологія. Ми провели Інтернет-опитування випадкової вибірки 600 компаній з числа членів асоціації „DIGITALEUROPE”. Запрошення взяти участь в опитуванні було надіслано відділам з маркетингу або логістики. Для диференціації спостережуваних груп використовувалися методи одностороннього дисперсійного аналізу та вторинного аналізу. Ми проаналізували процес виконання програми зворотної логістики у трьох групах з певним інтервалом з метою вивчення рівня здатності адаптації. Група 1 включає компанії, які реалізують офіційну програму зворотної логістики (RLP) вже понад п'ять років. Компанії, які здійснюють RLP менше п'яти років, були включені в групу 2, а компанії з групи 3 взагалі не застосовують офіційної програми RLP.

Результати. Між трьома групами виявлено суттєві відмінності, що стосуються чинників впровадження зворотної логістики, формулювання стратегії зворотної логістики та формалізації політики повернення. Компанії з більш тривалим досвідом впровадження RLP пристосовують свої ланцюги постачання до процесу зворотної логістики значно ефективніше, ніж інші компанії. Результати відображають позитивну здатність адаптації до зворотної логістики для компаній у галузі побутової електротехніки.

Обмеження дослідження. Дослідження з невеликою вибіркою, зосереджене лише на галузі електроніки, може обмежувати узагальнення. Майбутні дослідження повинно виходити за рамки однієї галузі економіки та передбачати ширший емпіричний аналіз для вивчення відмінностей адаптації до зворотної логістики компаній різних галузей.

*Translated by Polyglot Translation Bureau
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Adaptability to reverse logistics

Hans-Christian Pfohl¹, Nguyen Thi Van Ha²

Supply chain and network management Department, Darmstadt
Technology University, GERMANY, Hochschule Street 1,
E-mail: ¹pfohl@bwl.tu-darmstadt.de,
²nguyen@bwl.tu-darmstadt.de

Reverse logistics is growing fast in Europe where environment policies and green issues serve as central topic of circular economy and sustainable development. Additionally, there has been an obvious trend of increasing consumer returns due to more powerful customers, especially with the growing multichannel retailers. To date, companies have adapted their existing supply chain to reverse logistics that resolves the issues related to returns flows in order to comply with the law, to satisfy customers, and to reduce costs. On the basis of implementation time of a reverse logistics program, we identified significant differences related to implementation drivers, formulation of reverse logistics strategy, and formalization of returns policy in order to explore the adaptability.

Keywords – reverse logistics (RL), returns management, adaptability, reverse logistics program (RLP)

I. Introduction

Reverse logistics (RL) is defined as 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 [1]. RL refers to the role of logistics in recycling, waste disposal, and management of hazardous materials; as well as in processing returned merchandise due to damage, quality problems, seasonal inventory, salvage, recalls, and reposition inventory [2,3].

Adaptability is the ability to change or to be changed in order to match with challengeable situations which firms improve their capabilities and innovations to survive and to perform more successfully [4-7]. Handling of commercial returns and managing end-of-life returns (EoL) due to law enforcements and customer demands has brought many formidable challenges for companies in CE industry in Europe in recent years. There are many barriers and difficulties for implementing a successful reverse logistics program [6,8-10]. The obvious reason for neglecting to implement reverse logistics is cost related because of complexity and uncertainty in returns flows [11,12]. Despite the obstacles, many companies have taken responsible for their returned products at the end-of-life, and developing recovery strategy with environmental concerns because of laws enforcement and economic benefits [8]. They have identified the types and roles of

returns [13], developed returns policy [3] and made resource commitments [14]. Returns avoidance, gatekeeping and disposition guideline are integral components of firm's policy to respond to reverse logistics [15]. The overall integration of cross-functional departments [15,16] and strategic collaboration with different partners in supply chain for returns management [6] have been also the effective ways of adapting to reverse logistics.

Definition of a formal reverse logistics program (RLP) is extracted after reviewing different literatures and case studies [3,6,8,11,13,15-20]. It is defined as returns management process in which reverse logistics is regarded as important component of firm's business strategy, gained top management support and resource commitments, carefully developed with written policies and procedures, and clear responsibility of reverse logistics operations. We asked firms joining the survey about implementation time of their reverse logistics program with three groups following time interval of five years because we based on the time of 2005 at which the WEEE Directive went into effect in Europe. Three groups with different time range of implementing RLP supported us in deriving additional insights of adaptability to RL.

The study aims at exploring the hypothesis as to whether adaptability to reverse logistics is different among groups with different implementation time, following two main questions:

(1) How different are drivers for implementing reverse logistics among groups?

(2) How different are processes of formulating reverse logistics strategy and formalizing returns policy among groups?

In the following sections, a brief view of empirical basis is presented. Then, the results and findings are discussed.

II. Empirical basis

In order to investigate these questions, considerable attention was paid to designing of survey instrument. Depending on a comprehensive review of literatures and field interviews with some professionals, managers and consultant, a questionnaire for survey in Europe was shaped. The survey questionnaire was tested with six logistics professionals - three of them from academic field, two managers and one consultant. Some adjustments were conducted with the survey before posting online and mailing it. The survey was conducted in three phases, in which the online ones was firstly posted and then mailed by online survey service. Reminder mailings for each phase were sent after two weeks with some information about the first results.

Of the 600 companies in the sample, 88 completed and returned survey. Survey respondents were asked to reply each question using a 5-point Likert scale (1 = strongly agree, 5 = strongly disagree). The average response rate is 14.66%. The author in [21] suggested response rates of 10% being common because online questionnaires can be easily ignored and deleted at the touch of a button so getting a reasonable response rate can be challenging, especially with a sensitive topic like reverse logistics. A detail breakdown of sample characteristics is provided in Table 1.

We consider company size of each group by number of employees. One-way ANOVA was carried out to test whether difference exists with respect to this factor in three groups. It is stated that significant differences exist in company size among groups ($F = 21.946$, $Sig. = .000$), especially between group 1 and group 3 (Mean difference = $MD_{1,3} = 2.009$). Companies in group 1 and 2 often have larger size business than group 3.

Table 1

Breakdown of sample characteristics

Number of Employees	N	%
Manufacturer	57	64.8
Wholesaler	10	11.4
Retailer	21	23.9
Formal reverse logistics program	N	%
For years (more than 5 years)	38	43.2
Just do it (less than five years)	32	36.3
Not do it	18	20.5
Number of Employees	N	%
< 50	5	5.7
50 - 249	16	18.2
250 - 499	17	19.3
500 - 999	18	20.5
More than 1000	32	36.3
Total: 88 companies (14.66%)		

Wave analysis was also conducted to access differences between the late and early respondents following recommendations of [22]. No significant differences were found among the measurement variables. Therefore, non-response bias may not be an issue for the current research.

III. Results and findings 1

The presence or absence of the factors such as regulations, awareness of customer and society, and economic benefits can become drivers or barriers to reverse logistics implementation, which influence the adaptability to reverse logistics [13]. In order to find out significant difference of drivers between groups, ANOVA test was carried out with the results provided in Table 2.

It can be said that the null hypothesis of all six drivers with Levene test is accepted. Therefore, the corresponding Anova test is taken into account with significance differences existing in drivers of corporate image, cost reduction, corporate profitability, and reduction of negative impacts on environment.

Table 2

Anova test of driver for implementing reverse logistics

ANOVA	Levene Test		ANOVA	
	Statistic	Sig.	F	Sig.
Customer satisfaction	.634	.533	1.882	.159
Corporate image	2.838	.064	14.115	.000
Cost reduction	2.869	.062	6.312	.003
Corporate profitability	.219	.804	8.276	.001
Compliance with the laws	.321	.726	.292	.747
Reduce negative impacts	.979	.380	6.250	.002

The results show that the groups with a longer time implementation of RLP aim at exploring sustainable development with increasing corporate image including environmentally-friendly disposal, eco-design, product recovery and optimization of recycling [23], e.g. Miele, Siemens, and Sony Ericsson. Drivers of cost reduction and increasing corporate profitability are more important than only complying with the laws for companies in group 1 because they can implement an effective RLP with economic scales, cumulative experiences and technology supports [24]. Post-hoc analysis with Dunnett t-test conducted to investigate these findings is provided in Table 3.

Table 3

Post hoc test with multiple comparisons

Dependent Variable	(I) Formal program of RL	(J) Formal program of RL	Mean Difference (I-J)	Sig.
Drives (R)-customer satisfaction	Group 2	Group 1	0.207	0.410
	Group 3	Group 1	0.395	0.118
D-corporate image	Group 2	Group 1	0.507*	0.017
	Group 3	Group 1	1.187*	0.000
D-Cost reduction	Group 2	Group 1	0.553*	0.030
	Group 3	Group 1	0.886*	0.003
D-corporate profitability	Group 2	Group 1	0.576*	0.012
	Group 3	Group 1	0.930*	0.001
D-compliance with the laws	Group 2	Group 1	-0.151	0.808
	Group 3	Group 1	0.085	0.953
D-Reduce negative impacts	Group 2	Group 1	0.414	0.126
	Group 3	Group 1	0.956*	0.001

a. Dunnett t-tests treat one group as a control, and compare all other groups against it.
 *. The mean difference is significant at the 0.05 level.

There are no significant differences between groups in relation with the drivers of customer satisfaction and compliance with the laws. Most of the companies in three groups regard two factors as important drivers to develop RLP because of more powerful customers and pressures of society and authority on environmental issues [25-27].

IV. Results and findings 2

Reverse logistics program is being used popularly to recover returned products. Firms have formulated strategy for reverse logistics and formalized rules to implement it. The study tries to investigate the level of firm's adaptability to RL, especially to what extent the strategic management concerns in RL, because the strategic consideration gives the strong impetus for the successfully operational level.

Many companies in electronics industry such as Phillips, Electrolux, and Nokia have been aware of complexity and risks for commercial, repairable, end-of-use, and end-of-life returns [6]. They have adapted themselves by developing sustainability strategy. They have identified roles of returns in business, set goals and metrics, solved the problems with recovery strategy, and EoL management.

The increase in returns because of more powerful customers, especially with growth of multichannel retailer in electronics industry has made many companies formalize their returns policy. Formalization refers to the extent to which rules, procedures, instructions, and communications are written [28]. A more formal policy gives clearer guidelines for staff to handle with the returns such as gate-keeping, return material authorization, credit returns, and disposition options.

To evaluate processes of formulating RL strategy and formalizing returns policy among groups, 15 different variables were identified and made up the first construct to study. Because of the important number of variables, a factor analysis was conducted to reduce item dimension. Finally, the items explored include 9 factors (Table 4).

The results of ANOVA indicate that there are differences from formulating RL strategy among three groups. Larger size groups (group 1 and 2) have paid more attention to shaping RL strategy because they have regarded it as a component of corporate strategy. They are increasingly aware of the strategic importance of product returns [29]. In short terms, it may result in increasing costs, but pioneering companies have shown that with the right choices, reverse logistics program can be profitable [23,30]. They focused more on determining how to recapture value and recover assets ($MD_{3,1} = 1.304$, $Sig = .000$; $MD_{3,2} = .560$, $Sig = .003$), and developing a product recovery strategy ($MD_{3,1} = 1.243$, $Sig = .000$; $MD_{3,2} = .980$, $Sig = .002$).

Table 4

Results of levene test and anova

ANOVA	Levene Test		ANOVA	
	Statistic	Sig.	F	Sig.
Formulating RL strategy				
Determine roles of returns	2.178	.120	23.012	.000
Determine types of returns	1.108	.335	5.648	.005
Determine how to best recapture value and recover	.795	.455	13.718	.000
Develop product recovery strategy (Eco-design & EoL)	1.738	.182	8.143	.001
Set goals for RL and develop appropriate metrics	1.632	.202	9.946	.000
Formalizing returns policy				
Structure written guidelines for return requests	1.838	.165	2.812	.066
Conduct RMA process	.208	.813	14.843	.000
Develop credit rules	1.439	.243	6.129	.003
Develop disposition options	2.351	.101	11.197	.000

However, all three groups have much concern in structuring written guidelines to reduce the number of returns. Returns avoidance, gate-keeping and disposition options play an increasing important role in returns management process [3,15] because they make a considerable contribution to satisfying customers with clear instructions and also creating an effective RLP. Hence, there are no significant differences among groups related to this factor ($F = .165$, $Sig = .066$).

Developing returns policy with credit rules and RMA process relates to information about how long a product can be returned, how returned merchandise will be valued, and how credit authorization guidelines will be developed [31]. All three groups concern in developing clear credit rules for returns (mean = 2.0), especially with group 1 and 2 ($MD_{3,1} = .816$, $Sig = .002$) because invoicing cycle time of return material authorizations influences directly cash position of a company [29].

Developing disposition options refers to the decision about what to do with returned products and how to develop the returns network [3]. Formalized decision rules are used to determine whether products should scrapped or discarded, returned to a distribution center, sold in a secondary market [18]. It may also relate to evaluating if it is appropriate to outsource any of returns management activities to third-party logistics providers.

Group 1 invested in formalizing disposition options and returns network much more than the rest ones ($MD_{2-1} = .495$, $Sig = .018$; $MD_{3-1} = 1.026$, $Sig = .000$). However, most of companies have trend of collaborating with different supply chain partners to implement reverse logistics program more effectively [6].

Conclusion

Comparing the results among three groups, we see how different firms in electronics industry adapt to reverse logistics in strategic considerations. We identified that most of firms in three groups have paid increasing attention to reverse logistics in different levels. Compliance with the laws and satisfying customer are the common drivers for all firms to implement reverse logistics. This paper also analyzed their concerns in processes of formulating reverse logistics strategy and formalizing returns policy. Although reverse logistics is challengeable, there are more companies finding the effective ways to manage returns and recover value while reducing cost and increasing corporate profitability.

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