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# A survey on reverse logistics system of mobile phone industry in Hong Kong

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## Abstract

**Purpose** – It is not surprising that proper implementation of reverse logistics systems can result in better customer loyalty and reduction in operational costs due to reuse or remanufacturing of some parts. This is particularly important for those industries with a short product life cycle, like the mobile phone industry. The major objective of this paper is to present the results of a pilot survey with follow-up interviews, which was conducted for investigating the practices of reverse logistics in this industry.

**Design/methodology/approach** – A questionnaire survey was sent to the industrial participants, and follow-up interviews were conducted with the respondents.

**Findings** – On the one hand, reverse logistics systems are important to the industry; on the other hand, the low level of importance of reverse logistics relative to the other issues is still a major barrier in realizing reverse logistics systems.

**Originality/value** – It is not clear what the critical factors are in designing reverse logistics systems for the mobile phone industry. Based on the results, it is interesting to learn how to reach a compromise in dealing with this dilemma.

**Keywords** Supply chain management, Distribution management, Mobile communication systems, Reverse scheduling, Hong Kong

**Paper type** Research paper

## 1. Introduction

The usage rate of mobile phones in Hong Kong is relatively high as compared with other Asian countries. Mobile phone penetration rate is ranked as the second highest in Asia Pacific (International Telecommunication Union, 2004). Mobile phone is a kind of innovative product with short life cycle, resulting in a high disposal rate (will be proven later in this paper). In fact, reverse logistics activities have been integrated in the business in recent years. However, reverse logistics systems are complicated in terms of the scope involves (Fulconis, 2007). In order to gain benefits from reverse logistics systems, there is a need to investigate the planning, implementation, and controlling the systems properly (Tan *et al.* 2003; Naesens, 2007).

Reverse logistics can be defined as:

[...] the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or proper disposal (Rogers and Tibben-Lembke, 1999).



Dowlatshahi (2000) suggests that reverse logistics systems involve “the management of the flow of products or parts destined for remanufacturing, recycling, or disposal by effectively use of resources”. Since a mobile phone consists of a number of electronic modules, the potential for each of these parts for remanufacturing and reuse is very high, especially some of them are standard modules like radio frequency transceivers, display units, etc.

Not only true for mobile phone industry, reverse logistics is a relatively new research direction in the area of supply chain management (Dowlashahi, 2005). In fact, it “has had a significant economic impact on the industry as well as society” (Krumwiede and Sheu, 2002). However, reverse logistics are generally poorly managed due to the fact that more than one company may get involved in the reverse logistics process, and thus a holistic approach is required (Chapman and Corso, 2005). In this connection, redesign of the existing forward and reverse logistics processes pose a challenge to many companies.

With respect to mobile phone industry, Guide *et al.* (2003) demonstrated that how reuse or remanufacturing could help to improve the profit of the industry through an analytical model. Amini *et al.* (2005) showed that reverse logistics system could result in more profit, by designing a reverse logistics system for repair service effectively and efficiently. From this perspective, the mobile phone industry belongs to service industry. Above research were carried out, however, based on the assumption that reverse logistics systems are important to the mobile phone industry. The key driving factors for implementing reverse logistics systems for the mobile phone industry have not been investigated.

Based on the above discussion, it is not surprising to say that reverse logistics is beneficial to the mobile industry. However, what are the governing factors in designing such reverse logistics systems is still unclear. The main purpose of this paper is to conduct a questionnaire survey, and follow-up interviews with the key players in the mobile phone industry of Hong Kong to answer this question. The rest of this paper is organized as follows: Section 2 reveals the research methodology. Section 3 summarizes the results from the pilot research. Finally, section 4 is the concluding section.

## 2. Research methodology

This research intends to define factors affecting reverse logistics model specifically for mobile phone industry of Hong Kong, and best practices in this regards. The research methodology is reference to the one conducted by Rogers and Tibben-Lembke (1999). Target respondents of this research are selected from a range of supply chain positions: manufacturers, wholesalers, retailers, and service providers, in order to get a holistic view in terms of review logistics systems. Majority of these companies are small and medium enterprises. The survey is categorical (and descriptive) in nature. This is also the reason why follow-up interviews are carried out in order to verify the accuracy of the data collected.

In this research, findings were derived from classified information collected from surveys and follow-up interviews. Follow-up interviews had been conducted to serve two purposes:

- (1) as a countercheck to ensure the accuracy of the surveys; and
- (2) to provide a detailed understanding of the needs of the industry by asking additional questions, which were designed from the empirical results of the survey.

With reference to Merriam’s (1998) model, a list of key findings was generated based on the collected data in this research.

A questionnaire was developed and mailed to 100 mobile phone companies. Out of these 100 companies, 27 are undeliverable. In other words, effective research base is 73, while 34 of which were returned and considered as valid questionnaire. This results in a response rate of 47 percent. The research team then interviewed 34 managers in the mobile phone industry in Hong Kong. Most of them come from small-to-medium scaled mobile phone companies. By collecting the information, which is generated from the mailing survey and interviews, the main focus is to examine reverse logistics processes of the companies, in particular the mobile industry in Hong Kong. In the following sub-sections, a number of key findings through this empirical study will be summarized.

3. Results of questionnaire survey and follow-up interviews

3.1 Supply chain positions of the respondents

We invited companies from different domains (e.g. manufacturers, service firms, etc.) to participants in this research. Their backgrounds are summarized in Table I. Please be noted that the total percentage of respondents (i.e. sum of the right column) is more than 100 percent. This is because it is not uncommon that a company could be diversified as different roles in a supply chain.

3.2 Product life cycle of a typical mobile phone

As discussed at the beginning, products in the mobile phone industry are with short product life cycle. Therefore, the survey in this research also attempts to prove this argument. From the information of the respondents, it was found that more than 50 percent of the reported products have product life cycle between three to six months, and near 90 percent of these products have product life cycle less than one year. Numerical results are illustrated in Table II.

Table I.  
Supply chain positions of  
the respondents

Supply chain position	Percentage of respondents
Manufacturer	11.8
Wholesaler	88.2
Retailer	70.6
Service provider	5.9

Table II.  
Product life cycle of  
mobile phones

Product life cycle	Percentage
< 3 months	10.6
3-6 months	52.3
6-12 months	26.5
12 months +	10.6

### 3.3 Factors affecting reverse logistics

A number of barriers that make practising reverse logistics difficult were revealed by Rogers and Tibben-Lembke (1999). They are categorized as follows:

- (1) importance of reverse logistics relative to other issues;
- (2) company policies;
- (3) lack of systems;
- (4) financial resources;
- (5) personnel resources; and
- (6) legal issues.

Based on these factors, respondents were asked about what factors are critical in making implementation of reverse logistics difficult. The results are depicted in Table III.

In line with the findings from Rogers and Tibben-Lembke (1999), it is not surprising that the major barrier to reverse logistics is factor (1) above, i.e. relative unimportance of reverse logistics. Close to one third of the respondents (32.4 percent) has checked this factor in this regard. In Hong Kong, mobile phone firms are quite conservative towards reverse logistics, which is just not ranked at a high priority in business agenda.

The second barrier to reverse logistics, namely, restrictive company policies, affects close to one fourth of the respondents (23.5 percent). Unawareness of the benefits of reverse logistics is a direct antecedent of this barrier so that reverse logistics is not an agenda item on the company policy. However, one interesting trend is that the legislation in this regards, e.g. WEEE directive of the European Union, has been enforced in order to recover value from the end-of-life products, and to reduce the wastes from those products. This could make the decision makers to incorporate this aspect while they are formulating the company policy (Maxwell and van der Vorst, 2003).

The other factors could not be overlooked: about one fifth of the respondents (20.6 percent) think that lack of a proper system is a barrier for implementing reverse logistics; Financial and personnel issues contribute to 11.8 percent and 8.8 percent respectively regarding the barrier.

### 3.4 Why does mobile phone industry need reverse logistics?

This section investigates why mobile phone companies in Hong Kong attempts to integrate reverse logistics in their business. Rogers and Tibben-Lembke (1999) identified a number of strategic factors that could be considered as the motivations in

Barriers	Percentage
(1) Importance of reverse logistics relative to other issues	32.4
(2) Company policies	23.5
(3) Lack of systems	20.6
(4) Financial resources	11.8
(5) Personnel resources	8.8
(6) Legal issues	0.0

**Table III.**  
Barriers to reverse  
logistics

driving reverse logistics. Based on these, the following discussions summarized the major drivers or motivations, among those mentioned by Rogers and Tibben-Lembke (1999), for implementing reverse logistics systems in Hong Kong mobile phone industry, in accordance with the result of interviews:

- (1) *Recapture value and recover assets.* This is directly related to the potential economic benefits as a consequence of practicing reverse logistics. It is not surprising that some tangible assets (or value in general) could be recovered from reverse logistics activities. In fact, this can be reflected in another survey finding as shown in Table IV. It was found that majority of the returned products could in fact add extra values to the company. More than 40 percent of the returned goods were remanufacturing or repackaged which then could be resold. It is surprising that more than 20 percent of the returned goods could be resold as is.
- (2) *Reverse logistics as a strategic weapon.* Owing to advance in information technology, the mode of conducting business has changed in the past decades. A large portion of the manufacturing activities have been move to China. Consequently, profit margin originates from production activities alone is not high enough for running the business in a long run. Reverse logistics in still in its infancy for many telecommunication companies in Hong Kong. Therefore, the first mover in this regard could gain competitive advantages, and hence practicing reverse logistics could be a strategic move.
- (3) *Good corporate citizenship.* This is related to the factor (2) above. Social responsibility could be a tool to gain publicity. These policies are considered as a marketing incentive. The study suggests that firms are unlikely to incorporate reverse logistics in their business merely because of environmental benefit.

4. Conclusions

Keys factors in implementing reverse logistics systems of the mobile phone industry are explored through a survey and follow-up interviews. On one hand, reverse logistics systems are important to the industry; on the other hand, the low level of importance of reverse logistics relative to the other issues is still a major barrier in realizing reverse logistics systems. A direct implication which can be drawn from these findings is that there is a dilemma in implementing reverse logistics systems, as least for Hong Kong mobile phone industry. Research agenda should be set up to investigate how to promote the reverse logistics practices, and how to find a compromise in dealing with this dilemma. Although the findings of this paper are limited to Hong Kong mobile

Table IV.  
Activities for returned  
products

Activities	Percentage
Remanufactured/refurbished	32.6
Recycled (material reclaimed)	23.1
Resold as is	21.5
Repackaged and sold as new	9.5
Sold at outlet store	6.8
Landfill	6.5

phone industry, it is expected that similar situation could be identified in other industries and in other countries. In fact, this can be another research direction in verifying whether the same findings exist in other industries or not.

Apart from the drivers that are discussed above, environmental concern has been becoming a key driver that makes reverse logistics important in recent years (González-Torre *et al.*, 2004). In fact, pressure on environmental concerns is partly enforced by government legislation (Prendergast and Pitt, 1996). In this connection, there are plenty of opportunities in aligning company strategies in pursuing environmental goals with a proactive attitude for reverse logistics in order to gain competitive advantage. This direction is also in line with the top two activities getting involved with reverse logistics of the respondents in this paper. Although cost increase in complying with the said regulation may be inevitable, cost saving can also be achieved by carefully examine the logistics process and with a cooperative attitude among the partner companies.

A limitation of this research is the size of the survey, which is not large, because we were not attempting to conduct a full empirical research at the moment and this study serves as a pilot study. In order to further strengthen the proposed model, the scale of the survey should be extended so that the confidence level of the results could be enhanced. In addition to this, the respondents of this survey are limited to Hong Kong-based companies. In fact, the coverage of the respondents can be extended so that results on different regions can be compared.

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