ABSTRACT
A main activity in reverse logistics is the collection of the products to be recovered and the redistribution of the processed goods. The well managed network that never exists can reduce the problem in collection and remanufacturing of the parts. The consideration of a new networks need to be determined such as, the number and location of centers, the use of drop points in the collection, the issue of integrating the reverse chain with the forward chain and finally the establishing of the center. This paper describes organizations of reverse logistics of mobile telephones. Then, the research methodology used for finding and classifying the case studies are presented in this paper.

KEY WORDS
Reverse Logistic, Reverse Supply Chain, Mobile Telephone Parts

1. Introduction
Conventionally a product was manufactured and goes through the supply chain to a customer. However, more activities than those concerned with selling supply alone, like including service and product reused or repair are involved. The Waste Electrical and Electronic Equipment (WEEE) directive will cover mobile phone producers and distributors to be responsible for taking back and recycling old handsets and accessories.

Reverse logistics is the handling of products, components and materials during the recovery process. The success factors of reverse logistics are competition and marketing motives, direct economic motives and concerns with the environment. The motive for better reverse logistic is also the profit involvement in the remanufacturing systems of mobile telephone parts. Products, parts, materials, or equipment may go backwards in the logistic chain. Malfunctioning products may be detected after they are sent to customers (product recalls). In some case, the misplace of products delivered to customer may also be returned. Reverse logistic in conclusion can be for the following reasons; manufacturing returns, commercial returns, product recalls, warranty returns, service returns, end-of-use returns, and end-of-life returns. The profitability of re useable parts from mobile telephone depends on availability of supplied amount, quality, and demands of repair shops. The management of the center is designed for better control of reverse logistic in order to regain of the value from the used products. A main activity in reverse logistics is the collection of the products to be recovered and the redistribution of the processed goods. The well managed network that never exists can reduce the problem in collection and remanufacturing of the parts. The consideration of a new networks need to be determined such as, the number and location of centers, the use of drop points in the collection, the issue of integrating the reverse chain with the forward chain and finally the establishing of the center.

This paper describes organizations of reverse logistics of mobile telephones. Then, the research methodology used for finding and classifying the case studies are presented in this paper. After that, the models for the reverse logistic for mobile telephone is proposed with final remarks and research directions.

2. Supply Chain and Logistic
The supply chain integration faces problem in a lack of strategic alignment of information strategies in the chain, firm size of some supply chain actors, lack of awareness of potential benefits of information technology, lack of motivation, and being in a less developed industry or regional context. Co-operation between firms in achieving the necessary changes in business culture, in part arising from the diverse goals of the parties involved, and unequal risk and rewards discuss such difficulties in integrating information systems across firm boundaries in supply chains. However, apart from these papers there is little evidence of research on alignment of information strategies in supply chains. Several researches tried to show that this objection does not respond to reality, suggested a joint economic lot size model where the objective is to minimise the total relevant costs for both the vendor and the buyer.
However, it is clear how a partnership may be strategically useful to both sides, and how it can improve the inventory management policies (i.e. reduce the costs) by loosening some constraints.

2.2 Reverse logistic and supply Chain

Products, components, materials, equipment and even complete technical systems may go in opposite direction in the supply chain. Products has being reworked during manufacturing due to unsatisfactory quality, or with good materials or components being returned from the production floor. Malfunctioning products may be detected after they have entered the supply chain resulting in a pull back of products through the chain or product recalls. From this stage there are more activity is in the chain involved with the reverse flows on the basis of commercial agreements such as returning vs. taking back obsolete stocks of short-life products. In addition, in the business-to-consumer scenery, products may be sent back due to mismatches in demand and supply in terms of timing or product quality. During use and in presence of warranty or service possibilities, products may also be returned to be substituted by others, or to be repaired (warranty and service returns). Ultimately, even after use or product life, products are collected to be e.g. remanufactured, recycled or incinerated (end-of-use and end-of-life returns). At this point both material’s hazard and environmental impact have to be taken into account. products may reverse direction in the supply chain for a variety of reasons as listed below:

1. manufacturing returns
2. commercial returns
3. product recalls
4. warranty returns
5. service returns
6. end-of-use returns
7. end-of-life returns

Summarizing, a product is developed and goes into production following the supply chain with the purpose of reaching a customer. However, at any moment, the product may go back in the chain. From this moment on, the chain does not deal any longer with supply alone, but also with recovery-related activities. Ergo, we refer to it as the supply chain loop. This denomination underlines the possible integration of forward and reverse flows. Furthermore, it embraces both the closed loop supply chains, where supposedly the reverse flow goes back to the original user or original function, as well as open loop supply chains. Figure 1 illustrates the two phases of the life-path of a product, supply chain loop and customer. Generally, because of the presence of recovery activities, reverse logistics imposes some new characteristics on the management of the logistics system. This means that new functions or new participants can be introduced into the system e.g. the implementation of back-shipments of reusable materials or the location of collection, testing and sorting, or recovery centers. From the nature of the system structure, reverse logistics is of a convergent structure of a network from many sources to a few demand points. In the paper, there are several studies about location problems for reverse logistics systems. A two-level distribution and waste disposal problem, in which demand for products is met by plants while the waste generated by production is correctly disposed of at waste disposal units. A specific location problem of forward and reverse flows are simultaneously considered and have a strong interaction because recovered products are introduced as new ones into the forward flow. The decisions about locations of direct and reverse units are strongly connected. In the next section, we describe the context of the problem and then present the model that we propose.

3. The Model

The case of reverse logistic of used products after the end of life is mobile telephone. Incoming phones are repaired, scrapped or returned as un repair. It picks up product from the repair center and moves it back across the border with all necessary customs paperwork. In most cases, the consumer gets a new phone immediately, and the defective unit, once repaired, is sold again. Nevertheless, the replacement cycle for repaired equipment is a fast 48 to 72 hours. Other than the authorized center of each brand name telephone, outsourcing repair services Are expanding in Thailand. The concept for a disassembly cell for mobile phones Can be dissembled into many components. The first step is the operator of the cell removes the battery, identifies the type of the phone via a recognition system and fixes and easy to handle. The following disassembly process is done fully in the following steps. Due to the various available joining technologies for the different main parts of a mobile phone many tests have been carried out to find the optimal combination of disassembly stations. Our aim was to cause no damage of the printed wire board and the display and sort the other parts according to their material composition. The fractions which are obtained after the disassembly process include:

- Batteries
- frame or body of telephone
- keys pads
- Metals parts
- Printed Wire Boards
- Liquid Crystal Displays
The disassembly process optimally combines destructive and non-destructive disassembly technologies. The return-products are shipped back to remanufacturing centers after the end of life. The most case of this selected products which are mobile telephone parts are disassembled and selected products are used in the repair shop. Remanufacturing centers accept the checked returns from intermediate centers and are responsible for the process of remanufacturing. As a member of the forward channel, producers are in charge of the traditional production in order to meet, together with remanufacturing centers, the product demands of the customers. In such a system, we can see there are two kinds of flow. One flow from customers through intermediate centers to remanufacturing centers is formed by used products, while the other from remanufacturing centers or producers directly to customers consists of new products. All used products in this case are mobile telephone parts are first shipped back to intermediate centers where some of them will be disposed of for various reasons, like poor quality. The checked return-products will then be sent back to remanufacturing centers, where some of them may still be selected to reused in repair shop and some parts are disposed of. The product demands at the customers can be met by both producers and remanufacturing centers, which means that the remanufactured products from remanufacturing centers are considered the same as the new products from producers in terms of satisfying the customer demands.

4. Conclusion

Although some of the concepts of reverse logistics, such as the recycling of products, have been put into practice for years, it is only fairly recently that the integration of reverse logistics activities has been a real concern for the management and organization of logistics systems. There is, therefore, a need for research in this area and particularly in the planning and optimization of logistics systems including reverse activities. Analyzing the results, we demonstrate that reverse flows influence the decisions about location and allocation. This influence varies with the magnitude of the reverse flows, their distribution at demand sites and their correlation with forward flows. All parties hope to expand the partnerships into other areas and types of service. Utilizing its fixed-cost structure, repackaging and repaired units, and the handling of returns. Still, the effectiveness of those moves could be sabotaged by an under-performing aftermarket program. So the telephone companies will continue to look for ways to keep both its powerful customers and end-consumers happy by managing better center to organization customer service in repair of telephones. For further development, we can use the lower bounds therefore be able to solve effectively the problems with exact solutions. In addition, this research can be extended to facility location problems with capacity and the problems for other types of reverse logistics systems. It can also be included in the general framework of the hierarchical planning of a logistics system with reverse activities.

References