

RESEARCH OF CIRCULAR LOGISTICS PROCESS OF TELECOMMUNICATIONS OPERATORS

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Abstract: This paper first defines the logistics of the telecommunications operators and the circular logistics system of telecommunications operators. It points out that there exists important differences among logistics of telecommunications operators, manufacturing enterprises and materials distribution enterprises, and lacks the relevant research results. From the aspects of supply logistics, maintenance logistics and waste material logistics, it gives a detailed analysis of process of circular logistics of telecommunications operators. Finally, it points out that the research of circular logistics of telecommunications operators has important theoretical and practical value.

1 INTRODUCTION

Logistics of telecommunications operators is the internal logistics of the telecommunications operators. Telecommunications operators specialize in providing information and communication services, which belongs to the network service enterprises. Due to the particularity of the industry, and the enterprise logistics theory based on manufacturing enterprises or materials circulating enterprises is not suitable for telecommunications operators, logistics of telecommunications operators (and other service enterprise) and manufacturing enterprises or material circulating enterprise exist important differences. Although logistics plays an important role in telecommunications operators (and other service enterprise), people pay little concern to the research about logistics of telecommunications operators (and other service enterprise), (Arthur D, 1991).

Circular logistics system is part of the logistics system of connecting the social reproduction process. Its main function is to support the resource circulation, promote the realization of circular society and ensure the operation of circular society. Circular logistics system includes three types of different levels-enterprise, industry chain and

society (Ru Yi-hong, 2009). The circular logistics system of telecommunications operators is a subsystem of the social circular logistics system. The subsystem is a organic whole composed of key elements, such as reserve organizations, employees, establishments, equipments and planning, executing, control of the flow of material substance while material substance flow among the telecommunications operators, manufacturing enterprises, repair enterprises, disassembly enterprises and inside telecommunications operators. From the aspect of logistics process, the circular logistics of telecommunications operators can be divided into the process of supply logistics, maintenance logistics and waste material logistics. (Wang Ying-kui, 2010), as shown in Fig. 1.

2 THE SUPPLY LOGISTICS PROCESS OF TELECOMMUNICATIONS OPERATORS

Supply logistics process is responsible for providing logistics services for new purchased telecommunications facilities in the circular logistics system of

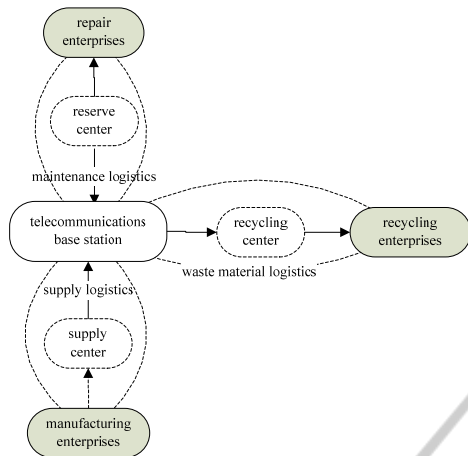


Figure 1: Structure of circular logistics system of telecommunications operators.

telecommunications operators. It mainly involves with four kinds of logistics nodes - manufacturing plants of telecommunication facilities, the supply center of telecommunication facilities, telecommunications base stations and reserve center of telecommunications facilities. Generally, a manufacturing plant of telecommunication facilities needs to provide telecommunication facilities simultaneously to multiple telecommunications base stations (reserve centers of telecommunications facilities), and a telecommunications base station (reserve center of telecommunications facilities) needs to equip (reserve) telecommunication facilities simultaneously from different manufacturing plants of telecommunication facilities. Therefore it presents a complex network topology structure of supply logistics subsystem of telecommunications operators (as shown in Fig.2).

There are two different kinds of flow directions - telecommunications base stations and reserve center of telecommunications facilities, of telecommunications facilities in the supply logistics process of telecommunications operators, which form two different supply logistics branching processes (as shown in Fig3).

2.1 Telecommunications Base Stations Supply Logistics Branching Process

Telecommunications base stations supply logistics branching process is the flowing process of telecommunications facilities in the circular logistics system of telecommunications operators in the process of providing telecommunication equipments to telecommunications base stations. Telecommunications base stations supply logistics branching

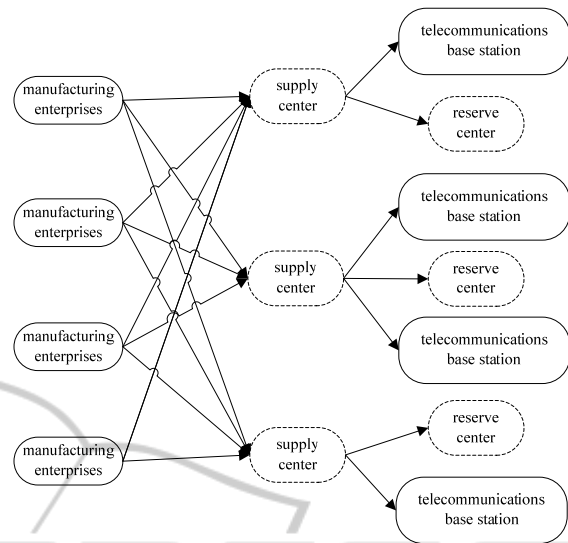


Figure 2: Topology structure of supply logistics of telecommunications operators.

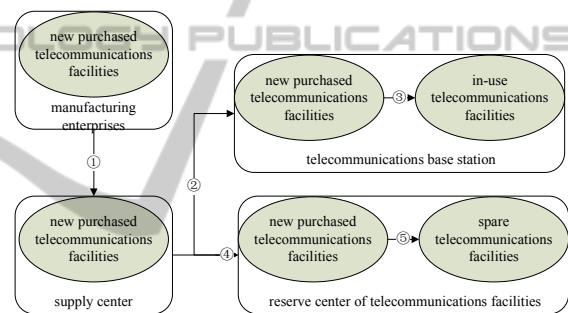


Figure 3: Supply logistics process of telecommunications operators.

process involves with three logistics nodes - manufacturing plants of telecommunication facilities, the supply center of telecommunication facilities, and telecommunications base stations, two logistics fluids – new purchased telecommunications facilities and in-use telecommunications facilities. The manufacturing plants of telecommunication facilities are places of producing new purchased telecommunications facilities, also the beginning of telecommunications base stations supply logistics branching process. The telecommunications base stations are places of installing new purchased telecommunications facilities, also the ending of telecommunications base stations supply logistics branching process. The supply center of telecommunication facilities is a hub of branching process of new purchased telecommunications facilities from manufacturing plants of telecommunication facilities to telecommunications base stations. The specific telecommunications base

stations supply logistics branching process works as follow. The new purchased telecommunications facilities are transported in batches from manufacturing plants of telecommunication facilities to corresponding supply center of telecommunication facilities(①). Then The new purchased telecommunications facilities are exchanged in supply center of telecommunication facilities, reset according to the places to use, and transported to different telecommunications base stations(②). The new purchased telecommunications facilities will finally become in-use telecommunications facilities after installation and lineup in telecommunications base stations(③).

2.2 Supplies Logistics Branching Process of Reserve Centre of Telecommunications Facilities

Supplies logistics branching process of reserve centre of telecommunications facilities is the process of telecommunications facilities in the circular logistics system of telecommunications operators when offering telecommunications facilities to reserve centre of telecommunications facilities. Supplies logistics branching process of reserve centre of telecommunications facilities involves with three logistics nodes - manufacturing enterprises of telecommunications facilities, supply centre of telecommunications facilities and reserve centre of telecommunications facilities, two logistics fluids - new purchased telecommunications facilities and spare telecommunications facilities. The manufacturing plants of telecommunication facilities are places of producing new purchased telecommunications facilities, also the beginning of supply logistics branching process of reserve centre of telecommunications facilities. The reserve centre of telecommunications facilities are places of reserving the spare telecommunications facility, also the ending of supplies logistics branching process of reserve centre of telecommunications facilities. The supply center of telecommunication facilities is a hub of branching process of new purchased telecommunications facilities from manufacturing plants of telecommunication facilities to the reserve centre of telecommunications. The specific supplies logistics branching process of reserve centre of telecommunications facilities works as follow. The new purchased telecommunications facility transport to the supply centre of telecommunications facilities in batches from manufacturing enterprises of telecommunications facilities(①). The new purchased facil-

ity is exchanged and restructured according to the disassembly place. Then it will be sent to reserve centers of telecommunications facilities(④). Subsequently the new purchased facility become the spare telecommunications facility after being store keeping in the reserve centre of telecommunications facilities(⑤).

3 MAINTENANCE LOGISTICS PROCESS OF TELECOMMUNICATIONS OPERATORS

Maintenance logistics process is responsible for providing logistics services for telecommunications facilities in the circular logistics system of telecommunications operators. It mainly involves with three kinds of logistics nodes - reserve centre of telecommunications facilities, telecommunications base stations and repair plants of telecommunications facilities. Reserve centre of telecommunications facilities is the core node of the maintenance logistics process and is responsible for the storage of spare and faulty telecommunications facilities, providing spare telecommunications facilities and reclaiming faulty telecommunications facilities among telecommunications base stations, consigning corresponding repair plants of telecommunications facilities to fix faulty telecommunications facilities and to reclaim the repaired telecommunications facilities (shown in Fig 4).

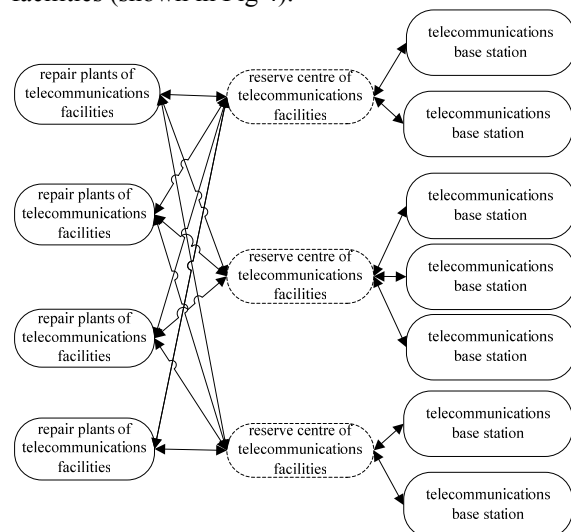


Figure 4: Topology structure of maintenance logistics of telecommunications operators.

There are two different kinds of flow directions - telecommunications base stations and repair plants of telecommunications facilities, of telecommunications facilities in the maintenance logistics process of telecommunications operators, which form two different maintenance logistics branching processes (shown in Fig 5).

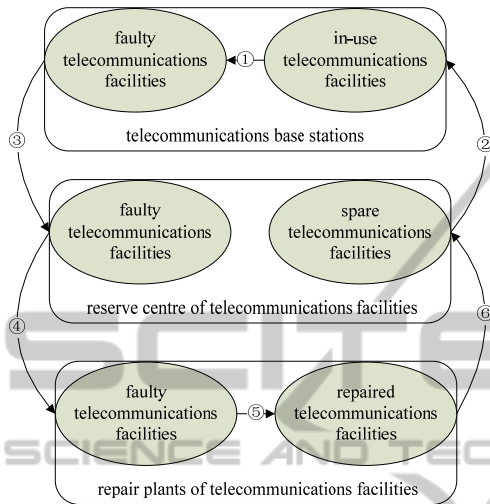


Figure 5: Maintenance logistics process of telecommunications operators.

3.1 Equipment Fault Process Logistics Branching Process

Equipment fault process logistics branching process is the flowing process of telecommunications facilities in the circular logistics system of telecommunications operators in processing faulty telecommunication equipment process. Equipment fault process logistics branching process involves with two logistics nodes - reserve centre of telecommunications facilities and telecommunications base stations, three logistics fluids - spare telecommunications facilities, in-use telecommunications facilities and faulty telecommunications facilities. Both of the beginning and the ending of equipment fault process logistics branching process is in the reserve centre of telecommunications facilities, passing through telecommunications base stations in the middle. The specific equipment fault process logistics branching process works as follow. The in-use telecommunications facility break down and change into faulty telecommunications facility(①). Then the spare telecommunications facility is sent from reserve centre of telecommunications facilities to the telecommunications base station corresponding to the faulty facility. The spare telecommunications

facility will replace the faulty telecommunications facility in the telecommunications base station and become the in-use telecommunications facility(②). The faulty telecommunications facility that being replaced will be sent to the reserve centre of telecommunications facilities and being stored from the telecommunications base station(③).

3.2 Faulty Equipments Maintenance Logistics Branching Process

Faulty equipments maintenance logistics branching process is the flowing process of telecommunications facilities in the circular logistics system of telecommunications operators in maintaining faulty telecommunication equipments process. Faulty equipments maintenance logistics branching process involves with two logistics nodes - reserve centre of telecommunications facilities and repair plants of telecommunications facilities, three logistics fluids - faulty telecommunications facilities, repaired telecommunications facilities and spare telecommunications facilities. Both of the beginning and the ending of faulty equipments maintenance logistics branching process is in the reserve centre of telecommunications facilities, passing through repair plants of telecommunications facilities in the middle. The specific faulty equipments maintenance logistics branching process works as follow. The faulty telecommunications facility is sent from reserve centre of telecommunications facilities to repair plants of telecommunications facilities(④). The faulty telecommunications facility will be repaired in the repair plants of telecommunications facilities and change into the repaired telecommunications facility(⑤). The repaired telecommunications facility then be sent back to the reserve centre of telecommunications facilities as a spare telecommunications facility from the repair plants of telecommunications facilities(⑥).

4 WASTE LOGISTICS PROCESS OF TELECOMMUNICATIONS OPERATORS

Waste logistics process is responsible for providing logistics services for waste telecommunications facilities in the circular logistics system of telecommunications operators. It mainly involves with four kinds of logistics nodes - disassembly plant of telecommunications facilities, recycle centre

of telecommunications facilities, telecommunications base station and reserve centre of telecommunications facilities. Generally, a recycle centre of telecommunications facilities can reclaim waste telecommunications facilities (of reserve centers of telecommunications facilities) of several telecommunications base stations. Plus it may offer waste telecommunications facilities to several disassembly plants of telecommunications facilities at the same time. Several recycle centers of telecommunications facilities may provide waste telecommunications facilities to a disassembly plant of telecommunications facilities at the same time as well (shown in Fig 6).

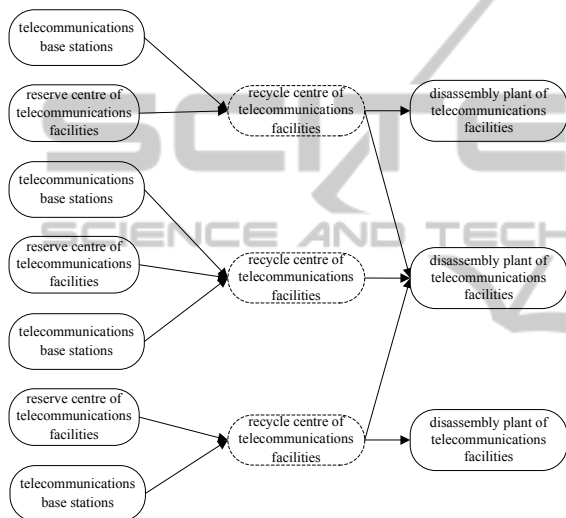


Figure 6: Topology structure of waste material logistics of telecommunications operators.

There are two different kinds of resources - telecommunications base station and reserve centre of telecommunications facilities, of waste telecommunications facilities in the waste logistics process of telecommunications operators, which form two different waste logistics branching processes (shown in Fig 7).

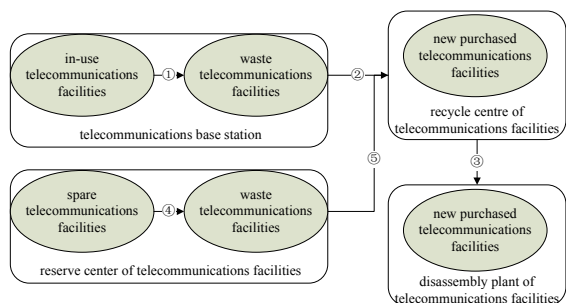


Figure 7: Waste material logistics process of telecommunications operators.

4.1 Waste Logistics Branching Process of Telecommunications Base station

Waste logistics branching process of telecommunications base station is the flowing process of in-use telecommunications facilities in the circular logistics system of telecommunications operators after in-use telecommunications facilities are broken down. Waste logistics branching process of telecommunications base station involves with three logistics nodes - telecommunications base station, recycle centre of telecommunications facilities and disassembly plant of telecommunications facilities, two logistics fluids - in-use telecommunications facilities and waste telecommunications facilities. The telecommunications base station is the origin of waste telecommunications facilities and the beginning of the waste logistics branching process of telecommunications base stations. The disassembly plant of telecommunications facilities is the place of extinction of waste telecommunications facilities and the end of the waste logistics branching process of telecommunications base station as well. Recycle centre of telecommunications facilities is the core of the flowing process that waste telecommunications facilities are sent from telecommunications base station to disassembly plant of telecommunications facilities. The specific Waste logistics branching process of telecommunications base station works as follow. The in-use telecommunications facility break down in the telecommunications base station and change into waste telecommunications facility(①). It is sent to the corresponding recycle centre of telecommunications facilities(②). In the recycle centre of telecommunications facilities, the waste telecommunications facility is exchanged and restructured according to the disassembly place. Then it will be sent to the corresponding disassembly plant of telecommunications facilities in batch(③).

4.2 Waste Logistics Branching Process of Reserve Centre of Telecommunications Facilities

Waste logistics branching process of reserve centre of telecommunications facilities is the flowing process of spare telecommunications facilities in the circular logistics system of telecommunications operators after spare telecommunications facilities are broken down. Waste logistics branching process of reserve centre of telecommunications facilities

involves with three logistics nodes - reserve centre of telecommunications facilities, recycle centre of telecommunications facilities and disassembly plant of telecommunications facilities, two logistics fluids - spare telecommunications facilities and waste telecommunications facilities. The reserve centre of telecommunications facilities is the origin of waste telecommunications facilities and the beginning of the waste logistics branching process of reserve centre of telecommunications facilities. The disassembly plant of telecommunications facilities is the place of extinction of waste telecommunications facilities and the end of the waste logistics branching process of reserve centre of telecommunications facilities as well. Recycle centre of telecommunications facilities is the core of the flowing process that waste telecommunications facilities are sent from reserve centre of telecommunications facilities to disassembly plant of telecommunications facilities. The specific waste logistics branching process reserve centre of telecommunications facilities works as follow. The spare telecommunications facility break down in the reserve centre of telecommunications facilities and change into waste telecommunications facility(④). First of all, it is sent to the corresponding recycle centre of telecommunications facilities(⑤). In the recycle centre of telecommunications facilities, the waste telecommunications facility is exchanged and restructured according to the disassembly place. Then it will be sent to the corresponding disassembly plant of telecommunications facilities in batches(③).

5 CONCLUSIONS

This paper is in deep analysis of circular logistics of topological and process structure of telecommunications operators. According to our study, we find that there are fundamental differences among telecom operators' logistics, manufacturing enterprises logistics and materials distribution enterprises logistics. The experience of manufacturing enterprises logistics and materials distribution enterprises logistics cannot be simply copy and apply to telecommunications operators. Telecommunications operators(and other service firm business) must draw the conclusion of industrial experience and innovate in logistics theory. Consequently they can come out with theory that based on industrial characters and direct the management and running of circular logistics of

telecommunications operators(and other service firm business). Study on circular logistics of telecommunications operators is significant to promoting study on logistics of service firm business and improving the theoretical system of the logistics.

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