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## Study on Scrap Automobile Manufacturers Reverse Logistics Partners Base on Evaluation Engineering

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### Abstract

Combined with the characteristics of automobile manufacturers, the evaluation index system of reverse logistics partner was constructed including cost, environment performance, service capacity and basic quality of the enterprise, then a new method of aggregating weight of the above indexes is supported, and TOPSIS method is used to evaluate the several partners.

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### 1. Introduction

Outsourcing is one of the important ways for the enterprises to obtain competitive advantage. In recent years, more and more automobile manufacturers devote themselves to their core business. So they outsource one after another logistics parts to related professional companies, for example, the Third Party Logistics. At present, the related scholars in China and overseas did a great deal of research on the selection of cooperated partners. For example, scholars including Rong Zhao<sup>[1]</sup> constructed elevation index system from the five aspects, resource ability, technology index, experience index, enterprise credit and price. Based on literature, scholars including Yan Wang<sup>[2]</sup> designed a evaluation index system including six first-level indexes, that is management level, technology strength, informatization level, cost factors, transportation ability, industry experience and network coverage, etc. Scholars including Chunxia Chan<sup>[3]</sup> constructed evaluation index system from two latitudes, comprehensive quality index and compatibility index. There are in total 25 third-class indexes. Through delivering questionnaires consulting experts, Scholars including Congyuan Tang<sup>[4]</sup> constructed index system from four aspects, source ability, technology index, management service quality and social environmental protection effect. Based on the above research, this paper designs a set of evaluation index system and evaluates based on the idea of comprehensive evaluation.

## 2. Evaluation index system of scrap automobile reverse logistics service supplier

Since the third party reverse logistics service supplier is service enterprise, corresponding to key successful factor, combined with the basic requirement of recycling economy, the author thinks the main factors of evaluation and choice include four dimensions, that is basic quality of the enterprise, service ability, environment performance and cost.

In the aspect of the basic quality of enterprise, usually the cooperation between automobile manufacturers and reverse logistics service suppliers is a long-termed process. In order to let the manufacturers focus on production and sales, the basic quality of the third party is particularly important, mainly including three second-class indexes, scale of enterprise, management level and enterprise credit. Service ability reflects reverse the service ability and level of logistics service supplier. The increasing number of automobiles drives the increase of the number of scrap automobiles and the speed of scrapping, which requires reverse logistics service supplier must be equipped with certain service ability to deal with the returned stuff in specific time. Since the marketing region of automobile products is vast, so it also demands for network coverage of reverse logistics service suppliers, including annual dealing ability, technology service level and the coverage of logistics network. Environmental performance mainly reflects the condition of environmental protection: since recycling and dispose of automobile is legal duty of automobile manufacturer required by many countries, automobile enterprises need to know whether the third party logistics service suppliers have related environment production quality. Cost index means the cost of the automobile manufacturers who carry out reverse logistics management: in the mode of outsourcing reverse logistics, automobile manufactures do not directly deal with or use the retrieved products. Only because of the pressure from law and regulation, they hope to finish reverse logistics task within the limits prescribed by law with the lease cost.

Base on the above analysis, the structural mode like form 1 can be constructed.

**form 1: evaluation index system of scrap automobile the third party reverse logistics service supplier**

Evaluation index of scrap automobile reverse logistics the third party service supplier	Service ability U1	Ratio of good condition of retrieved automobiles U11
		Coverage of logistics network U12
		Proceeding rate of recycling center U13
		Annual proceeding ability U14
		Technology service ability U15
	Basic quality of the enterprise U2	Enterprise credit U21
		Enterprise scale U22
		Standardization of management U23
	Environment performance U3	Times of environmental protection accident U31
		Number of environmental protection awards U32
		Ability of proceeding waste U33
		Whether obtain international quality authentication U34
	Cost U4	Outsourcing cost U41
		Distribution cost U42
		Staff cost U43
		Recycling U44

In form 1: Ratio of automobile’s good condition (U11) mainly means due to the service supplier, some accessories were damage. We can set a period of time and use the damaged number divides the total recycled

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