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## Risk Prediction of City Distribution Engineering Based on BP

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### Abstract

City distribution engineering has the large number of random factors when it is operating, such as demand uncertainty, asymmetric information, and supplier uncertainty. These factors led to city distribution management risk and affect the daily operation. According to the characteristics of the city logistics, this paper proposed a city distribution risk assessment system, and established risk prediction model with BP neural network and simulation by MATLAB. The historical data of the risk are classified collation in this paper. And it proved that the risk prediction model is applicability and feasibility according to this date.

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### 1. Introduction

City Logistics has gradually become a mainstream between the commercial and retail. It makes great contributions to expanding domestic demand and stimulating economic growth. City logistics achieve a goal for urban economic and social sustainable development. According to goods flowing, especially transporting in the city, it is figuring out logistics problems within many methods which are coordinating, rational planning, the overall controlling and etc. The most important part of city logistics is distribution. It is the base on which city logistics obtain scale economies. And it is the key to generating economic value added<sup>[1]</sup>. Therefore, establishing an effective risk assessment system and to predict the overall city distribution engineering risk can early response and reduce the risk, further to ensuring the smooth and efficient operation of urban logistics.

### 2. Identification of City Distribution Engineering Risk

Key Success Factors (KSF) was proposed by William Zani, Harvard University professor, in 1970. KSF who bases on the key factors determine the information needed by the system. It is a kind of MIS planning approach. According to the current system, there are many variables affecting the overall implementation of the system, including a number of key and major factors (the success variable). Through identifying key success factors, it finds

a set of key information for goals and determines the priority of system development. The key success factors are the key factors to business success. KSF is to analysis these key factors, and then focus on these key factors to determine the system requirements and planning <sup>[2]</sup>.

The strategic goal of city distribution management is that provide more kind of goods at a better quality and lower prices, cost the least costs when they transport goods at correct time in the correct location to the correct target.

The rationality of city logistics system is affected by many complex factors, such as the level of socio-economic development, industrial structure, urban planning and layout. Therefore, when inspecting the operation of city logistics system, it is necessary to integrating internal and external factors in logistics systems. After analysis the characteristics of the city distribution system, there are a number of risk factors who affect normal operation of the city logistics. According to KSF, it got a table of City Distribution engineering Risk index, as follow:

Table 1 City Distribution engineering Risk Index

Level index	Secondary index	standard
external risks	city distribution demand rate	city distribution demand / city logistics capability
	city logistics facilities utilization rate	city logistics facilities Utilization / total amount of city logistics facilities
	city logistics average inventory risk	expert assessment
	goods turnover rate	goods turnover / total
	the risk of infrastructure investment changes	expert assessment
	city GDP variation rate	city GDP variation /GDP
	migration risk	expert assessment
	economic restructuring risk	expert assessment
	natural disasters risk	expert assessment
internal risks	equipment failure risk	The amount of equipment failure / total
	structural risk	expert assessment
	node element concentration	expert assessment
	network flowing risk	expert assessment
	equipment obsolescence risk	expert assessment
	information transmission risk	Distortion of information / total
	goods destruction risk	damaged goods / total
	the adverse effects of environment on the truck	expert assessment
	capacity of the logistics center	expert assessment
	the inaptitude distribution path risk	expert assessment

### 3. BP neural network prediction model

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