

## *Retraction*

# **Retracted: Application Research of Data Mining in Urban Logistics Planning**

### **Wireless Communications and Mobile Computing**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### **References**

- [1] X. Wang, "Application Research of Data Mining in Urban Logistics Planning," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 3868746, 13 pages, 2022.

## Research Article

# Application Research of Data Mining in Urban Logistics Planning

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With the continuous development of information technology and the arrival of the era of big data, data mining technology has been applied in more and more fields. Data mining refers to the process of searching for information hidden in a large amount of data through algorithms. This process uses various technical methods and has a wide range of applications. Urban logistics is a special logistics system, an open and complex system, which has a profound impact on the development of cities. Using data mining technology to plan urban logistics can more efficiently improve the speed of urban logistics, save logistics costs, and speed up the construction of urban economy. This paper is aimed at studying urban logistics planning model based on data mining and analyzing the calculation accuracy and reliability of the model. This paper proposes to establish a relevant input-output data mining model according to the relationship between various industries and logistics in the city and conduct a calculation test on the model. The test results show that the data mining model proposed in this paper has an average calculation accuracy of over 85% and a maximum of 99%, which shows that the model has strong practical reliability and can be effectively applied to the planning of urban logistics.

## 1. Introduction

With the development of the logistics information platform, a wealth of data information is generated on the platform every day, such as the daily punch-in data of drivers entering and leaving the park, the daily transportation information of dangerous goods, and the daily exchange log information of suppliers on the platform. This information is encapsulated in a specific structure of the platform database, distributed at various levels. If the valuable laws behind it are effectively revealed through data mining [1], the logistics information platform will play a greater role and provide more valuable information. Enterprises make full use of logistics network equipment, reduce logistics costs, and provide evidence and decision support tools. The government coordinates the local logistics industry to respond to dynamic trends in function and role, providing a scientific basis for discovery and teaching. The facilities of the logistics network provide a scientific basis for the ultimate realization of the regional logistics industry and continuously optimize the layout of the logistics network and facility functions, laying the foundation for maximizing the benefits and efficiency of the local

logistics network. This paper will use data mining methods and tools to mine these data and find potentially valuable rules to achieve optimal allocation of logistics resources. Finally, the logistics information service status analysis system is designed and implemented based on the data mining model. It can be used by governments and businesses to use logistics, providing network equipment, reducing logistics costs, scientific evidence, and decision support tools.

At present, the research on data mining in the field of logistics at home and abroad has become more and more mature, but there are few researches on the data mining of logistics information platform. In terms of data extraction, by extracting the useful information that has been structured in the logistics information platform database, this paper establishes a data mining application scenario, clarifies the system construction goals, establishes mining algorithms and models, and designs the database, and finally, realize logistics information sharing through front-end technology. In the design and implementation of data mining application systems, there are many application models of data mining in the logistics field, but they are not comprehensive enough. Most of them are algorithm modeling for a single

scene to solve a problem. Some researches only perform prediction [2], association analysis, or cluster analysis on the data; and a data mining system with multiple algorithms, multiple tools, and multiple scenarios is not enough; it has not been able to apply several major research points of data mining to a field or discipline to form a three-dimensional and comprehensive mining framework from points to surfaces; in addition, there is less research on combining data mining with the real data of the logistics information platform, and integrating the applications of data analysis, mining, and visualization into the system, so further development and research are needed for the above aspects.

As the center and backbone of the economy, the city is the center of commodity distribution and processing. Moreover, urban logistics facilities and infrastructure are complete, human capital is abundant, consumption is concentrated and demand is large, and transportation and information are developed. However, there is economic asymmetry between the city and the surrounding areas, and it is necessary to organize production and circulation beneficially, which must form a city-centered urban logistics. Taking the lead in developing logistics in the city will double the speed of logistics development.

The innovation of this paper is a comprehensive introduction to the application of data mining technology in urban logistics planning. At the same time, the data mining model proposed in this paper is tested, and its actual reliability has been verified.

## 2. Related Work

Transportation is closely linked to the city and is influenced by planning related to the future of the city. Trends such as population growth and aging, livable cities, the resilience of infrastructure, and changing land use patterns are reshaping how people and goods move in urban areas. A number of scholars have conducted research on urban logistics, among which Bjorgen conducted interviews with representatives of public authorities and private stakeholders in the logistics supply chain of three cities in Norway. The findings suggest that, despite public agency concerns related to the urbanization and sustainability of freight transport indirectly, there is no overall strategy for urban freight or urban logistics in the cities studied. In addition, there is poor planning and decision-making regarding freight shipments. Local authorities are made up of many fragmented departments and seem to lack the resources for urban freight. However, these authorities are aware of the need to make their own contributions in the process of establishing urban logistics programs. The application of freight logistics planning and distribution innovation is a hot research area in sustainable urban logistics, however, a large number of studies on freight logistics design lack comprehensive consideration of the application of distribution innovation. He further promotes the sustainability of urban logistics systems from a future perspective by analyzing research gaps in the existing literature. Based on an analysis of article correlations, He identified the most important research contributions in urban logistics network design and distribution innovation devel-

opment. He found four research gaps in network design and distribution innovation, and in response to these gaps, He proposed a research framework for SFFUFP (sustainable and flexible future urban freight planning) based on urban development trends. At the same time, he discussed the further research directions of urban freight planning, and the research framework of SFFUFP can further promote sustainable urban logistics from the perspective of future management. Park et al. aim to derive a location with high economical effect and high urban space efficiency for coffee shops (a fast-growing business in Korea). Regional radius analysis shows that the number of coffee shops near large logistics facilities, public institutions, transportation facilities, schools, medical, and welfare facilities is higher, in descending order. This result shows that private investors are increasing due to the growing investment value of coffee shops. This study is interesting because it can select efficient locations for new coffee shops while considering urban space factors, thereby reducing logistics costs [3]. Islam and Arakawa propose a rolling planning method for two-stage logistics systems under unsteady demand, which has two objectives. The first objective is to propose a mathematical model that estimates optimal production quantities, delivery quantities, and inventory levels to control stock-outs and excess inventory in make-to-stock production systems, thereby minimizing total logistics costs. The second goal is to generate optimal routes to minimize the distance from the center of mass to the store when truck capacity is limited. To achieve the second goal, Islam and Arakawa propose a store clustering mathematical model that integrates store location, variable demand, and truck capacity. After clustering, apply the traveling salesman problem (TSP, which is a problem: given a series of cities and the distance between each pair of cities, find the shortest circuit that visits each city once and returns to the starting city.) The technique generates optimal routes and driving distances within the clusters. The model and solution methods proposed by Islam and Arakawa are implemented in an urban area in a numerical example. The results show that the proposed model performs well in handling erratic demand by minimizing the total logistics cost and controlling stock-out and overstock situations within the planning horizon [4]. Large urban areas are major logistics markets. Raimbault, based on qualitative methods (policy papers and semistructured interviews), analyzes inland port space and institutional involvement in logistics policy across all metropolitan areas. The results show that the inland port agency contributes to the manageability of the logistics problem in the metropolis, but in the end, does not allow the regulation of the expansion of logistics [5]. Roads and parking lots are where freight vehicles clash with other urban activities, resulting in traffic congestion, illegal parking, pollution, and road safety issues. To solve this problem, urban logistics distribution zones have become a real solution to facilitate the delivery and pickup operations of urban freight vehicles, ensure the accessibility of delivery drivers, reduce congestion, and reduce traffic congestion. Therefore, Moufad and Jawab reported the planning and implementation needs of urban distribution centers. Compared with the existing literature, Moufad and Jawab

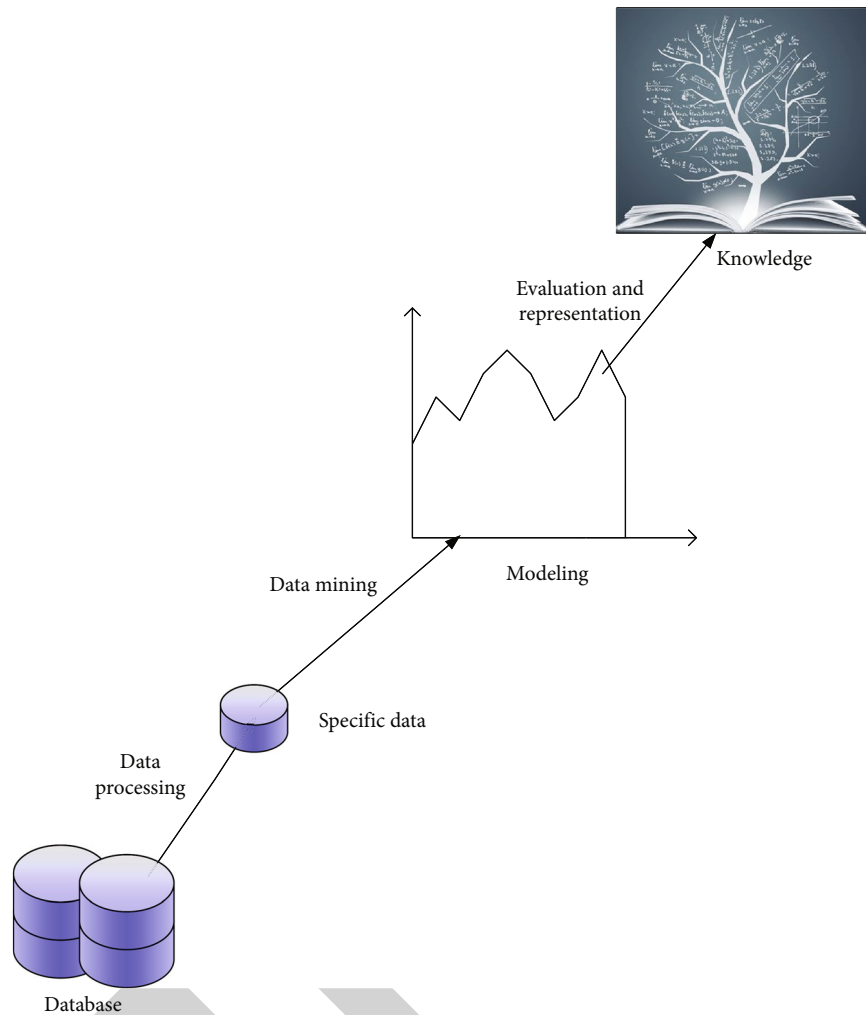


FIGURE 1: Conceptual diagram of data mining.

propose a hybrid application method, which is divided into two parts: “exploratory survey” and “facility-vehicle observation” survey. With this method, city authorities can be used to efficiently estimate city delivery areas, allowing simple replication of the proposed framework in other cities [6]. The above research has carried out a practical test on the application of data mining technology and confirmed its practical feasibility. However, the data mining scheme in the field of urban logistics involves less, so it needs more in-depth discussion.

### 3. Urban Logistics Planning Based on Data Mining

#### 3.1. Data Mining Technology

- (1) *Concept.* There are various definitions of data mining, but almost all of them use increasingly enhanced computational and advanced statistical analysis techniques to uncover the relationships available in large databases. The conceptual diagram of data mining is shown in Figure 1. In general, data mining is the process of extracting hidden, unknown, but

potentially useful information and knowledge [7, 8]. From the logistics field, data mining technology is a new logistics information processing technology. It is a class of in-depth data analysis methods that can also be described as defined by an enterprise’s business goals. It is an advanced and effective method for exploring and analyzing a large amount of data, revealing hidden, unknown, or verifying known regularities, and further modeling them

- (2) *Origin and Development.* Data mining was first proposed at the 11th International Conference on Artificial Intelligence in 1989, and its development is divided into multiple stages, as shown in Figure 2
- (3) *Data Mining Process.* First of all, the mining environment must be determined. The determination of the environment can be shown in Figure 3

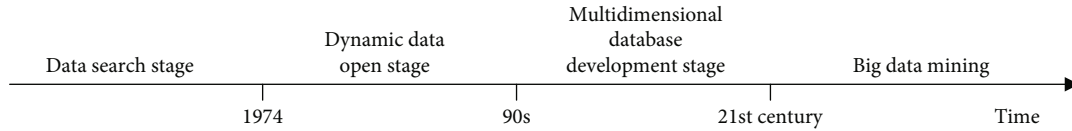


FIGURE 2: Development of data mining.

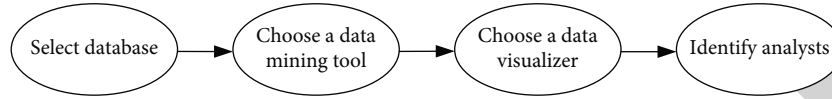


FIGURE 3: Block diagram of the data mining environment.

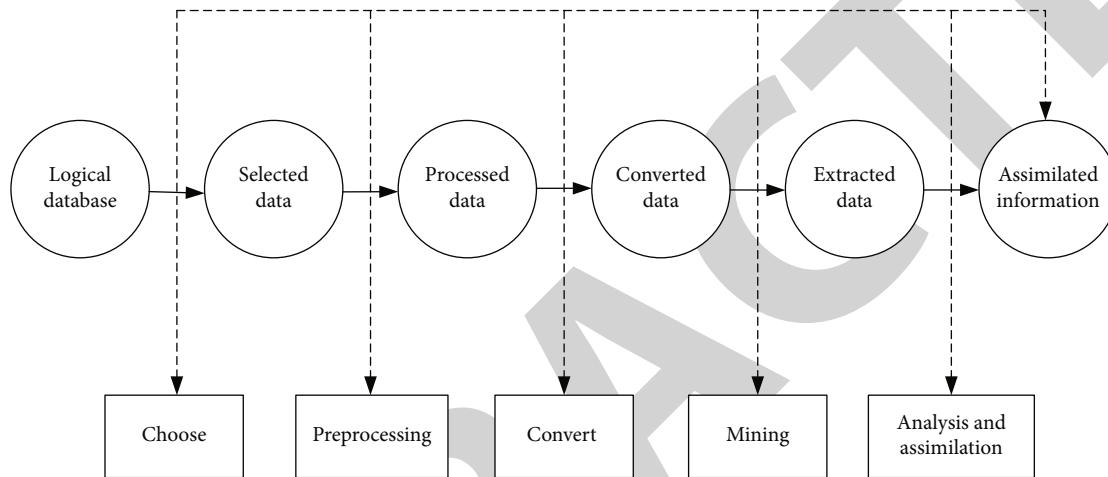


FIGURE 4: Basic steps of the data mining process.

The second is data mining, which is the complete process of mining useful, previously unknown and information from large databases and using it to make decisions and deepen knowledge, as shown in Figure 4.

- (4) *Features.* The main function of data mining is to model, analyze, transform, and extract a large amount of business data in the logistics company database to extract key data that supports decision-making in the logistics industry [9]
- (5) *The difference between data mining and AI and statistics.* In order to facilitate the distinction, the differences between the three can be shown in Table 1
- (6) *Common Techniques of Data Mining.* The commonly used techniques of data mining are shown in Figure 5, including neural network [10–12], decision tree, genetic algorithm, nearest neighbor algorithm, and rule induction [13]

Neural network (ANN for short) is a data model that simulates the structure of the human brain. The neural network learns from a set of input data, modeled on the nonlinear predictive model of the physiological neural network structure, and adjusts model parameters based on this new

cognition to discover patterns in the data. Neural networks provide a relatively efficient and simple method for solving complex problems and can easily solve problems with hundreds of parameters. A decision tree is a typical classification algorithm that can get rules like what results will be obtained under what conditions. For example, it builds a decision tree model of the transportation network and then subdivides it to find the option that is most likely to have the lowest total transportation cost. Commonly used decision tree algorithms are ID3, C4, and CART. The advantage of decision trees is that they generate easy-to-understand rules. If you build a decision tree containing hundreds of attributes, although it looks complicated, the meaning described by each path from the root node to the leaf node is still understandable. Furthermore, decision tree algorithms are relatively inexpensive and are good at dealing with nonnumerical data. The use of decision tree algorithm should also pay attention to its limitations, and it is more difficult to predict continuous fields. A lot of preprocessing is required for time-sequential data, and the explicitness of decision trees may mislead users. Genetic algorithm is an optimization technology based on evolution theory and using design methods such as genetic combination, genetic variation, and natural selection. It has now played a significant role in optimizing computational and classification machine learning methods [14, 15]. Because the genetic algorithm utilizes the idea of biological evolution and heredity, it has

TABLE 1: The difference between data mining and AI and statistics.

Technology	Difference of concept	Difference of features
Data mining	Comprehensive use of various technologies including AI and statistics	Focus on the problem
AI	A computer technology that simulates human brain computing	Dedicated to pattern discovery and prediction
Statistics	A mathematics subject	Pursue precision

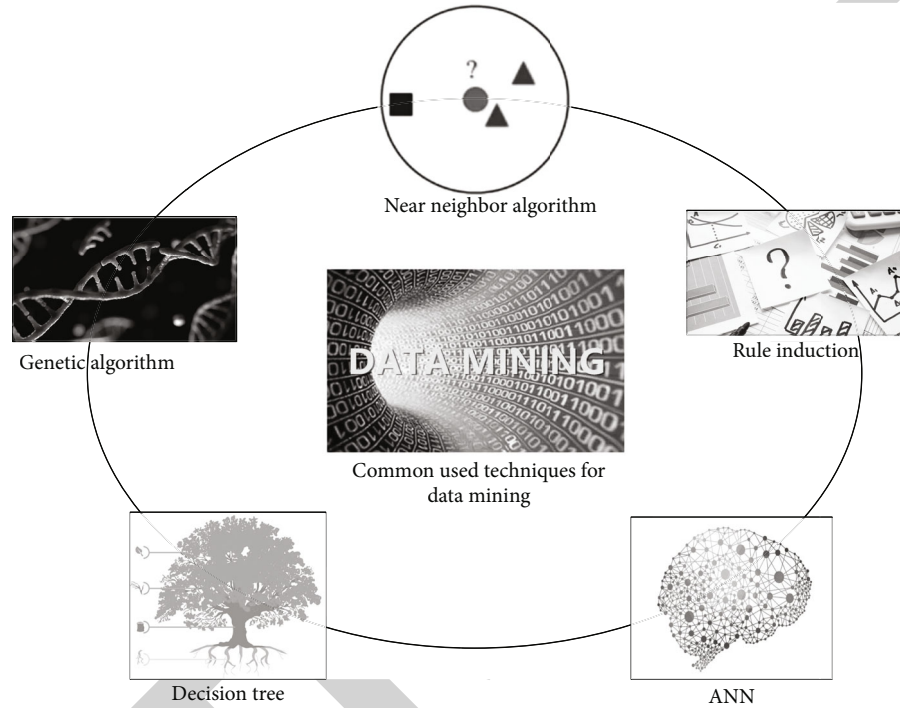


FIGURE 5: Common techniques for data mining.

many characteristics that are different from traditional methods. First, it deals with encoded sets of problem parameters, not the parameters themselves. In this way, the problems that are difficult to solve by traditional methods can be solved by genetic algorithms, because it is not constrained by constraints (such as the continuity of functions, the existence of derivatives, and single extreme values). Second, the genetic algorithm solves at many points in the search space at the same time, which reduces the possibility of converging to a local minimum and increases the parallelism of processing. In addition, the genetic algorithm is also easy to be used in combination with other technologies, and it is easy to intervene in the existing model and has scalability. The nearest neighbor algorithm, a method of classifying each adjacent record in a data set, is one of the easiest techniques to use and understand. The algorithm can be simply understood as objects that are “close” to each other will have similar predicted values. In this way, if the predicted value of one of the objects is known, it can also be used to predict its nearest neighbor object. The nearest neighbor algorithm is to detect the nearest matching samples in a way that people think in a

similar way. The nearest neighbor algorithm also handles well in terms of automation, as it is very robust to dirty and missing data. Rule induction is to summarize and extract valuable IF-THEN rules through statistical methods. Rule induction techniques are widely used in data mining, where rules are generated by segmenting data sets using certain statistical methods. A large number of rule-based techniques are currently used for data mining, the most common being the Mentor G4.5 algorithm. Additionally, a mentorless algorithm is used to generate association rules. Figure 6 lists the basic structure of the neural network and decision tree.

- (7) *Function*. The main functions of data mining are as follows: the first is automatic prediction of trends and behaviors; the second is association analysis; the third is cluster analysis; the fourth is concept description; the fifth is deviation prediction [16, 17]
- (8) *Research Direction of Data Mining*. At present, the research focus of data mining revolves around mining algorithms. Data mining integrates research in data statistics, AI, machine learning, and other

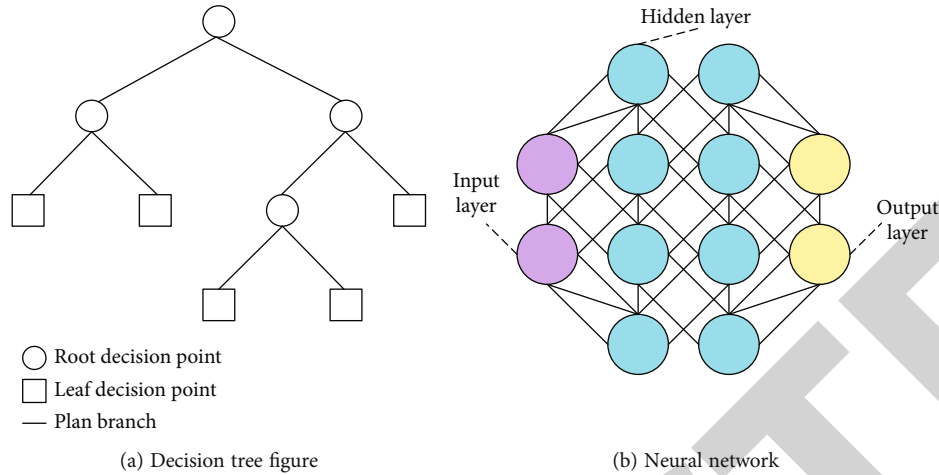


FIGURE 6: Basic structure of two data mining techniques.

disciplines. With the rapid growth of data mining tools in practical applications, mature algorithms from related disciplines are constantly being added to data mining. Figure 7 shows the current popular research directions of data mining [18]

- (9) *Application Fields of Data Mining.* Data mining currently has successful application cases in many application fields such as medicine, telecommunications, and logistics. As more and more business requirements are continuously clarified, the fields of data mining applications and the problems solved will become more and more extensive. The typical applications of data mining technology in the logistics industry are as follows: first is to understand the overall situation of transportation. Through classified information—by the type of goods, the transportation cost, quantity, location, date, etc. of each goods should be well known to understand the daily operation and inventory changes. The second is to reduce inventory costs. Through the data mining system, the transportation data and inventory data are centralized, and through data analysis, it is determined which goods should be shipped first, so as to ensure the correct inventory and reduce inventory costs. The third is the reference analysis of cargo grouping layout and transportation recommendation. By mining relevant information from statistical records, it can be found that customers who transport a certain kind of cargo may transport other cargoes, so as to form a fixed transportation recommendation or maintain a certain combination. The fourth is market and trend analysis. Through data mining, data mining and analysis can be carried out on seasonality, transportation volume, and the trend of goods varieties and inventory, so as to reduce risks and make decisions. The fifth is customer segmentation, that is, dividing customers into different groups according to data analysis, which

enables businesses to treat customers in different segments in different ways. Six is cross profit. Cross-benefiting is the process of selling new services to existing customers. Cross-profit is based on the principle of mutual benefit for both sides of the business. Customers benefit from getting more services that better meet their needs, and companies benefit from business growth. In many cases, the data mining of the old customer's status is consistent with the data mining of the new customer. The advantage of cross-profit is that enterprises can easily obtain rich information about old customers, which is very helpful for the accuracy of data mining [19, 20]

### 3.2. Urban Logistics Planning

- (1) *Related Concepts.* The concept of “logistics” began to take shape in the early 20th century and was gradually perfected in the early 1990s. Its connotation is very rich, involving many related activities such as information, transportation, inventory, warehousing, material handling, and packaging. Logistics is an integrated system formed by these originally independent but related activities. Urban logistics planning is to consider the overall social interests of the city, urban economic development, external environment function positioning, etc., starting from the needs of future logistics development, comprehensively considering urban economy, transportation, and environment. The process of constructing an efficient urban logistics system that meets the needs of urban development [21]
- (2) *The Characteristics of Urban Logistics.* Urban logistics belongs to mesoscopic theory, which is between macrologistics and micrologistics. It can be seen as the transformation of many enterprises from micrologistics to intercity macrologistics, which is closely related to the micrologistics within enterprises. Urban logistics includes extensive, large-scale flows, and variable flow directions. Urban logistics is based

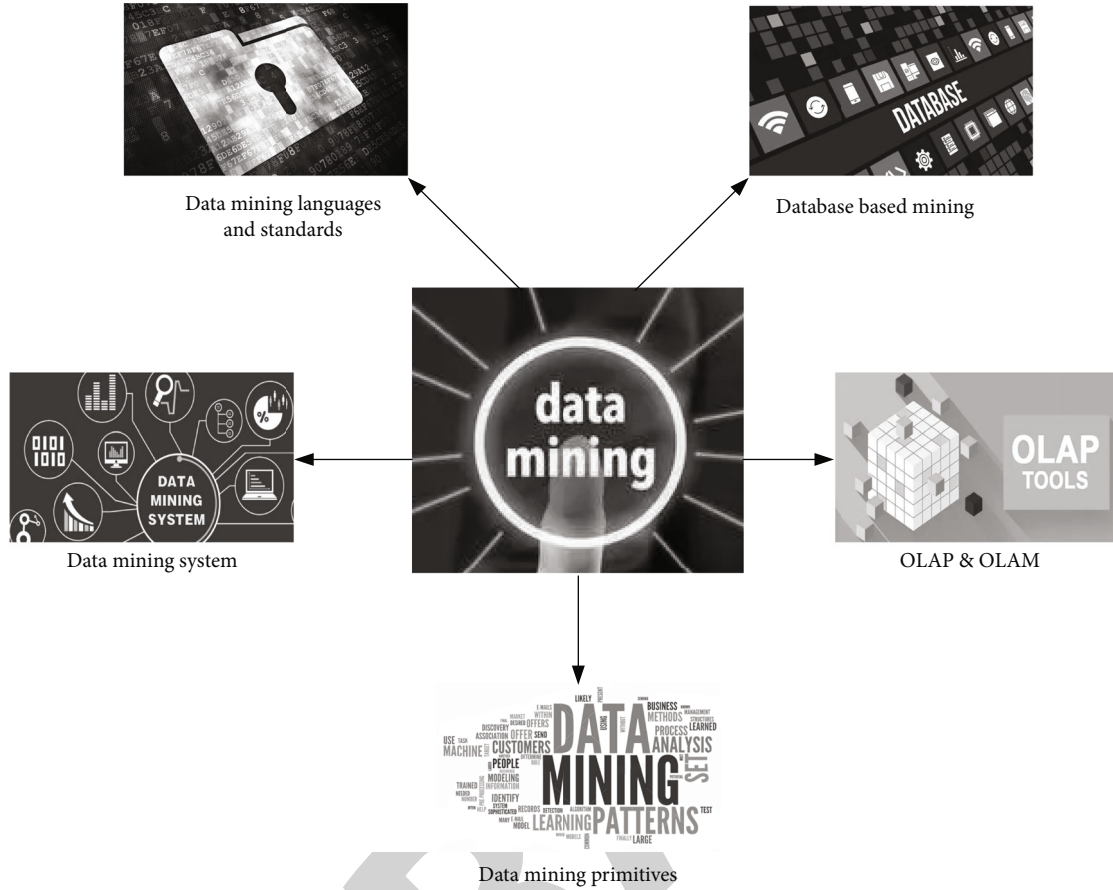


FIGURE 7: Popular research directions of data mining.

on the urban road system, with many logistics nodes and wide distribution [22]

- (3) *Urban Logistics Planning System.* Urban logistics planning includes logistics infrastructure planning, logistics information platform planning, and logistics policy platform planning, as shown in Figure 8

3.3. *Data Mining Model of Urban Logistics Industry.* Assuming that the total output of the logistics industry is represented by  $X$ , and the product demand is represented by  $Y$ , then, the total output can be expressed as

$$X_i = \sum_{j=1}^n x_{ij} + Y_i. \quad (1)$$

Among them,  $i$  represents the product input category, and  $j$  represents the product output category.

Let  $D$  represent the loss of fixed assets,  $V$  represent the labor remuneration, and  $M$  represent the production tax, then, the total input is

$$\sum_{i=1}^n x_{ij} + D_j + V_j + M_j = X_j. \quad (2)$$

Use  $a$  to represent the product consumption coefficient,

and the direct consumption coefficient is the core of the input-output table. The basic model of the input-output table is derived from the balance relationship of the input-output table on the basis of the direct consumption coefficient. Then, it can be expressed as

$$a_{ij} = \frac{x_{ij}}{X_j}. \quad (3)$$

Therefore, substituting equation (3) into equation (1) gives

$$(I - A)X = Y, \quad (4)$$

$$X = (I - A)^{-1}Y. \quad (5)$$

In the equation,  $A$  represents the matrix of the product consumption coefficient, and  $(I - A)^{-1}$  is an inverse matrix.

Similarly, equation (3) can be substituted into equation (2) to obtain

$$X = \frac{N}{I - A_c}. \quad (6)$$

In the equation,  $N$  represents the increase of product types.



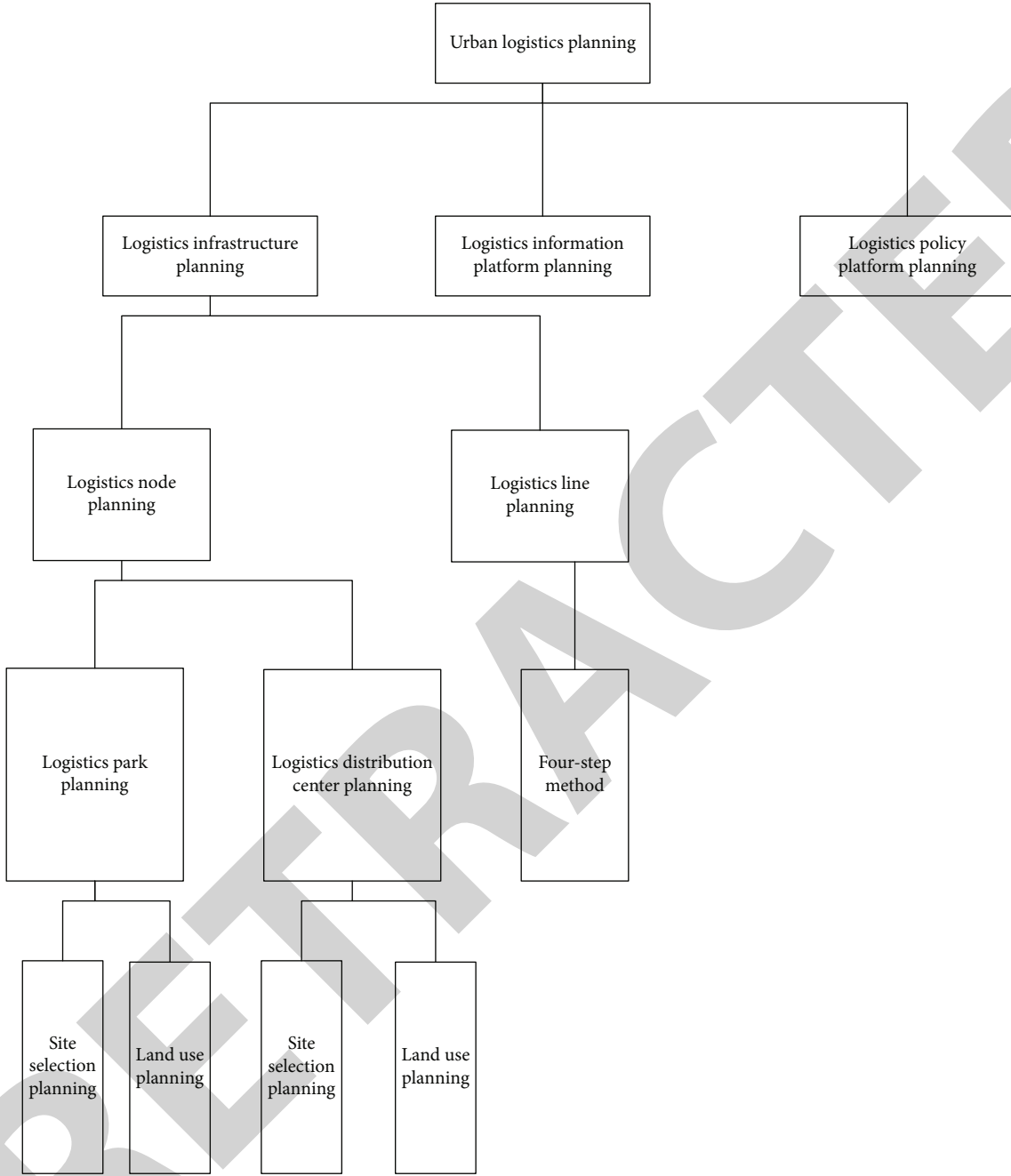


FIGURE 8: Urban logistics planning system.

Then, the consumption coefficient matrix can be expressed as

$$A_c = \begin{pmatrix} \sum_{i=1}^n a_{n0} & 0 & 0 \\ 0 & \sum_{i=1}^n a_{i2} & 0 \\ \dots & \dots & \dots \\ \dots & \dots & \sum_{i=1}^n a_{in} \end{pmatrix}. \quad (7)$$

The intermediate input ratio of urban logistics industry is represented by  $F$ , then

$$F_j = \frac{\sum_{i=1}^n x_{ij}}{\sum_{i=1}^n x_{ij} + N_j}. \quad (8)$$

The intermediate demand ratio of the industry is denoted by  $G$ , then

$$G_i = \frac{\sum_{i=1}^n x_{ij}}{\sum_{i=1}^n x_{ij} + Y_j}. \quad (9)$$

TABLE 2: Direct consumption coefficient of each industry.

Input and output	Primary industry	Secondary industry	Tertiary industry	Transportation industry
Primary industry	0.060	0.011	0.004	0.001
Secondary industry	0.403	0.591	0.214	0.222
Tertiary industry	0.071	0.110	0.294	0.096
Transportation industry	0.030	0.042	0.025	0.227

The complete consumption coefficient  $B$  can be expressed as

$$B = (I - A)^{-1} - I. \quad (10)$$

The full distribution ratio is

$$h_{ij} = \frac{x_{ij}}{X_i}. \quad (11)$$

The sum of the direct distribution ratio and the indirect distribution ratio is

$$l_{ij} = h_{ij} + \sum_{k=1} l_{ik} h_{kj}. \quad (12)$$

That is, the matrix equation:

$$L = \frac{1}{I - H} + I. \quad (13)$$

In the equation,  $L$  represents the total indirect distribution ratio.

The industrial influence is denoted by  $t$ , which is the sum of the columns of the inverse matrix, namely,

$$t_j = \sum_{i=1}^n \bar{b}_{ij}. \quad (14)$$

Where  $\bar{b}_{ij}$  is the inverse matrix.

The influence coefficient is represented by  $T$ , which reflects the degree of influence of a logistics industry on urban economic development, which is

$$T_j = \frac{\sum_{i=1}^n \bar{b}_{ij}}{1/n \sum_{j=1}^n \sum_{i=1}^n \bar{b}_{ij}}. \quad (15)$$

The industry sensitivity is denoted by  $s$ , which is the sum of the rows of the inverse matrix, namely,

$$s_i = \sum_{j=1}^n \bar{b}_{ij}. \quad (16)$$

The sensitivity coefficient is represented by  $S$ , which

TABLE 3: Optimized industrial data structure table.

Industry	Output parameter values
Logistics	0.065
Primary industry	0.024
Secondary industry	0.548
Tertiary industry	0.429

TABLE 4: Investment planning of a city's logistics industry to other industries: billion yuan.

Year	Primary industry	Secondary industry	Tertiary industry	Transportation industry
2018	1.898	57.266	10.656	39.052
2019	1.822	64.122	12.094	39.648
2020	1.778	71.354	13.48	43.248

reflects the sensitivity of a logistics industry to changes in the urban economy, and can be expressed as

$$S_i = \frac{\sum_{j=1}^n \bar{b}_{ij}}{1/n \sum_{i=1}^n \sum_{j=1}^n \bar{b}_{ij}}. \quad (17)$$

According to equation (5), it can be seen that the total output of a logistics industry is related to the product of the inverse matrix and the product demand. If the induced amount of a certain demand production in a certain industry is represented by  $Z$ , then

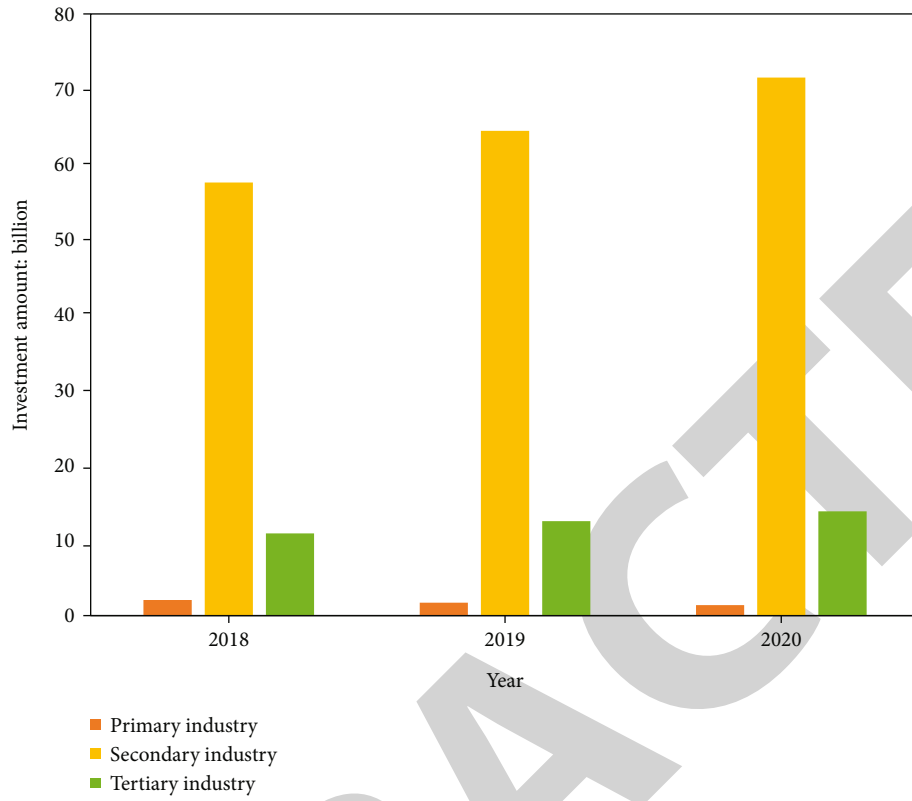
$$Z_i^s = \sum_{k=1}^n \bar{b}_{ik} Y_k^s. \quad (18)$$

In the equation,  $Y_k^s$  is the demand amount of the  $s$ th item of the industry.

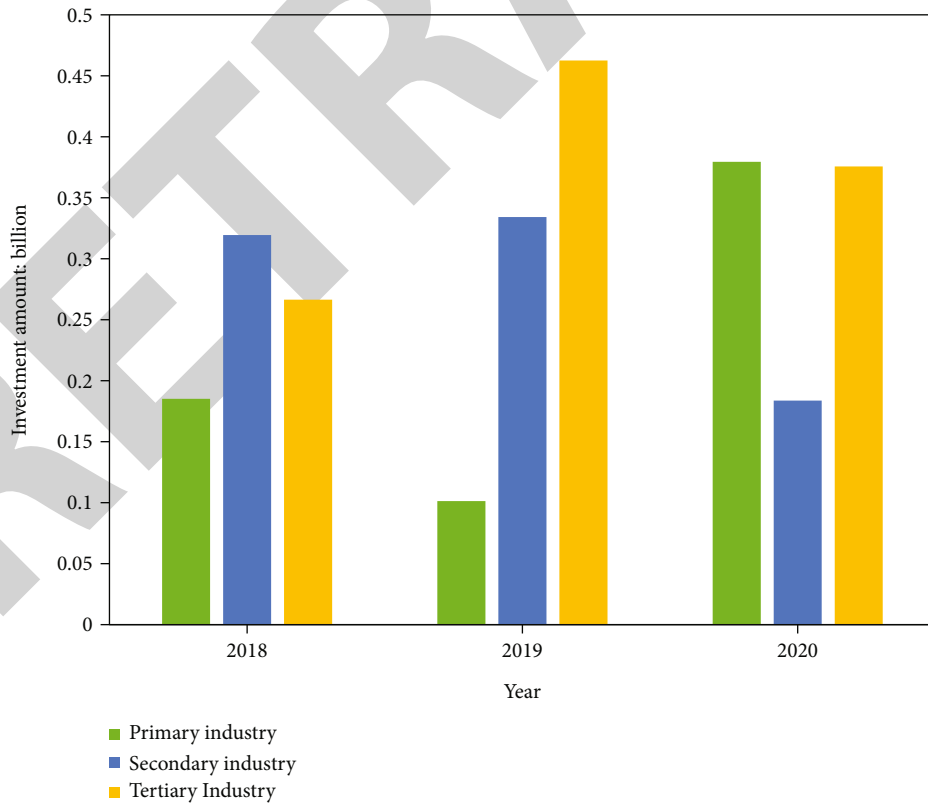
The induction coefficient of each industry is represented by  $W$ , then

$$W_i^s = \frac{\sum_{k=1}^n \bar{b}_{ik} Y_k^s}{\sum_{k=1}^n Y_k^s}. \quad (19)$$

The production dependence of each industry is represented by  $Q$ , which is the ratio of the induced amount to the total output, namely,

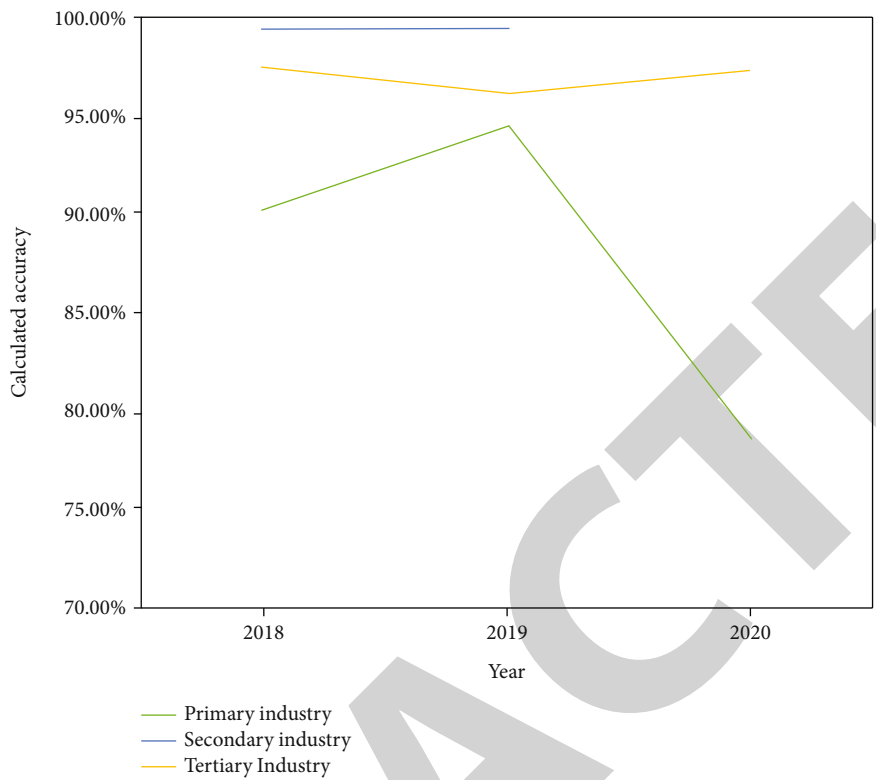


(a) Logistics planning investment

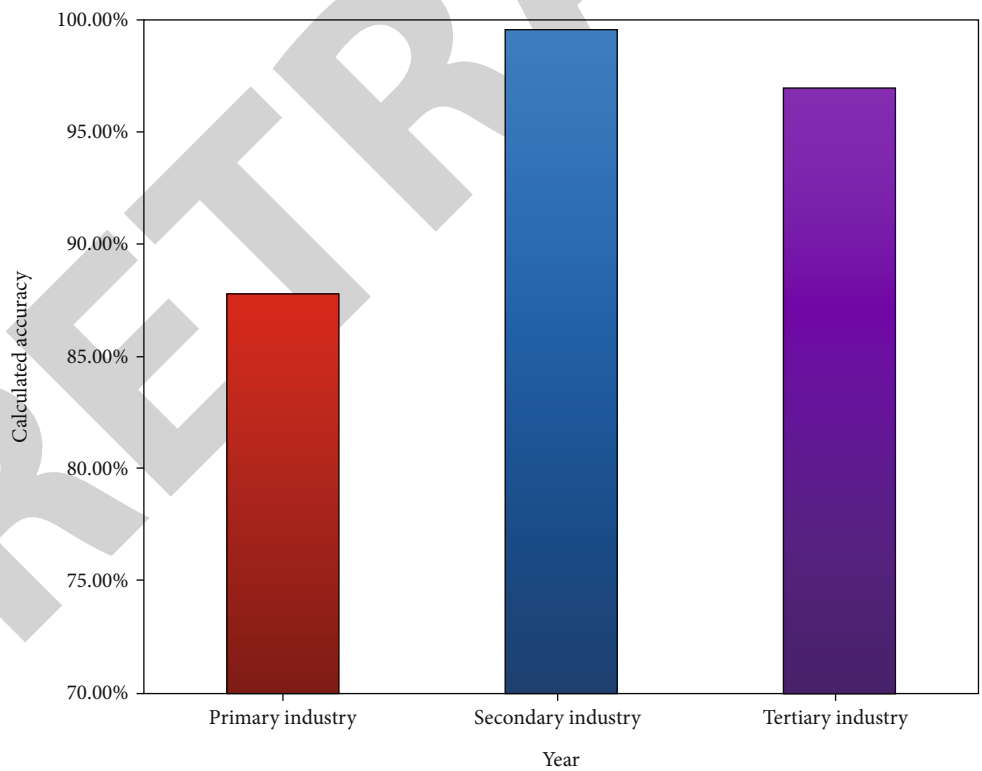


(b) Actual investment difference in logistics planning

FIGURE 9: Logistics planning input value from 2018 to 2020.



(a) Calculation accuracy of logistics planning investment in 2018-2020



(b) Average calculation accuracy of logistics planning investment in each industry

FIGURE 10: The urban logistics planning calculation accuracy of the data mining model.

$$Q_i^s = \frac{\sum_{k=1}^n \overline{b_{ik}} Y_k^s}{X_i} \quad (20)$$

$W$  and  $Q$ , respectively, represent the effect of changes in industrial demand on induced industries and the degree of production dependence [23].

#### 4. Prediction of Logistics Planning Model Based on Data Mining

**4.1. Data Selection.** This paper calculates the consumption coefficient obtained from the relevant data of the primary, secondary, tertiary industries, and the transportation industry in a city, as shown in Table 2.

By optimizing the data, the coefficient table of the logistics industry and other industries can be obtained, as shown in Table 3.

This article collates the city's logistics planning table for urban industries from 2018 to 2020 through relevant public information, as shown in Table 4.

**4.2. Data Analysis.** Using the data and the urban logistics industry data mining model proposed in this paper, the city's logistics planning input value from 2018 to 2020 is calculated, and the comparison chart shown in Figure 9 is obtained.

From figure (a), it can be seen that the second industry has a larger investment in urban logistics, because compared with the primary and tertiary industries, the secondary industry is the main demand industry for logistics services. It can be seen from figure (b) that the difference between the city's logistics planning investment and the actual investment calculated by the data mining model of this paper does not exceed 500 million. In addition, this paper calculates its calculation accuracy, as shown in Figure 10.

It can be seen from Figure 10 that the calculation accuracy of the data mining calculation model proposed in this paper for urban logistics planning is generally higher than 85%, and the highest is 99%. It shows that the calculation model has high reliability and can actually be used in urban logistics planning.

#### 5. Discussion

To begin with, the logistics industry is still a developing sector that has yet to be included in China's statistical system. Collecting relevant data is extremely difficult. As a result, some of the data in this paper have used alternative indicators to conduct relevant empirical research on the logistics industry's contribution to urban economic growth. Adopting more scientific and reasonable indicators for empirical research should be one of the key issues for further in-depth research after the enrichment and perfection of statistical data for China's logistics industry.

Second, the technology, products, labor services, import and export, investment, and price links between the logistics industry and the urban industrial structure should all be considered. However, this paper only provides a quantitative analysis of the technical and economic links between logis-

tics and the input of the urban industrial structure, as well as a qualitative description of other links. As a result, it is hoped that in future research, market factors such as price and investment can be fully considered, and further quantitative analysis can be conducted using the input-output model. Furthermore, due to data limitations, this paper focuses on the input-output technical and economic relationship between Tianjin's logistics industry and the city's industrial structure in 2002, rather than historical data analysis or city comparisons. As a result, after the data has been perfected, detailed historical data analysis and comparative analysis of different cities are required for empirical analysis. Third, due to the difficulty in obtaining statistical data, research on the mechanism of logistics acting on the evolution of urban spatial structure is primarily conducted using qualitative research methods, which lack statistical data support. Following that, in-depth theoretical discussions on the basis of logistics index quantification and modeling should be conducted in subsequent research. Because urban spatial structure theory is still in its infancy, there are numerous explanations for its connotation, and it lacks specific and quantifiable indicators like urbanization. As a result, using rigorous and standardized mathematical methods to express and deduce in the analysis process is difficult. To construct the mathematical expression form of the theory, it is necessary to begin with the indexation of urban spatial structure [24].

In a word, this research is a very challenging subject, and the above problems still need time and knowledge accumulation in the research of logistics and urban space economic development.

#### 6. Conclusions

This paper firstly summarizes the research purpose and content of this paper in the abstract part and introduces the background meaning and some key content of this paper in the introduction part. Second, some scholars' research results on the main content of this paper are listed in the relevant work part, in order to understand the current situation of data mining technology and urban logistics. In the theoretical research part, this paper firstly introduces data mining technology, including its concept, origin, development, core technology, algorithm, and process. Second, it introduces urban logistics, including its concept, origin, characteristics, and basic system of urban logistics. Finally, it explains the urban logistics planning algorithm based on data mining and analyzes the relationship between logistics planning input and various industries in the city. In the test of the model, this paper first selects the relevant data of the city's primary, secondary, tertiary industries, and logistics planning, calculates and organizes these data according to the data mining model proposed in this paper, and finally combines the chart to illustrate the test results. The final result shows that the data mining model proposed in this paper has high calculation accuracy and reliability for urban logistics planning and can be effectively applied to urban logistics planning.

## Data Availability

The dataset used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The author does not have any possible conflicts of interest.

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