

Resource Integration Efficiency Analysis of Precision Instrument under Data Mining

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Abstract: This study aims to explore the factors that affect the integration efficiency of resources in the use of various precision instruments by enterprises. A strategy to improve the resource integration efficiency of enterprises is proposed. Firstly, the theory and integration technology of precision instruments are described. Decision tree technology in the field of data mining technology is introduced as a basis. The effectiveness of computers for resource integration work is explored. The influence of resource integration efficiency is discussed from five factors: government subsidy, fiscal taxation, commodity preference, enterprise market financing, and enterprise financial department planning. The financial department has the most significant impact, and most of the other four factors emphasize the capital utilization of enterprises and the motivation of employees. Therefore, it is proposed that the financial department of enterprises should be improved. Regarding the ability of market financing, it is emphasized that employee incentive strategies should be submitted to achieve the ultimate goal of improving the efficiency of resource integration, which provides a particular theoretical reference for the customization of enterprise resource data acquisition strategies.

Keywords: Data mining, Resource integration, Precision instruments, Efficiency analysis, Corporate finance.

1. Introduction

How enterprises and institutions obtain the world's more advanced and sophisticated data resources is necessary for developing society and even a country. It is a very rigorous strategic strategy [1]. From the current point of view, collecting and integrating innovation resources is a way to apply rationally and allocate resources to achieve the integration of politics, technology, economy, and culture [2]. To meet the needs of the new era, enterprises and institutions should constantly improve the acquisition rate and utilization rate of sophisticated data resources, which is of great significance to society and the country.

Due to the globalized economic environment, enterprises in various countries need to integrate and utilize the world's advanced technology and data resources to carry out brand-new financial operations. Laird et al. (2020) argued that using the economic power of these resources to provide incentives and funding for biodiversity conservation. The resulting policies may significantly impact how genetic resources and related information are collected, stored, shared, used, and configured in research partnerships [3]. This illustrates the importance of collecting and using new types of data. Knapp et al. (2020) used a complementary metal-oxide-semiconductor detector to collect highly accurate and stable photometric data of nearby exoplanet systems. They improved the corresponding pointing and thermal performance [4]. This study demonstrated that high-precision data collection requires high stability and precision instruments. Esmail et al. (2020) derived the collection efficiency in the beam spot area as a function of the lateral distribution of the charge density in the ionization chamber. They determined that the collection efficiency is positively related to the applied voltage, beam size, and beam energy,

but not to the beam the current intensity is negatively correlated [5]. It shows that the data integration efficiency of precision instruments will be affected by objective factors.

Therefore, the efficiency of data resource collection and integration of precision instruments will be carried out. Firstly, the theoretical knowledge related to data mining is expounded, and the relationship between decision trees and data collection in data mining is revealed. Secondly, the resource integration theory of precision instruments for industry innovation is discussed, and the functional requirements of computer-based data mining are analyzed. Afterward, the influencing factors of the integration efficiency of innovation resources are tested and examined. Suggestions for improving integration efficiency are put forward to provide theoretical support for related enterprises. The innovation of the research lies in the combination of computer and data mining to explore the factors affecting the resource integration efficiency of instruments.

2. Methods

2.1. Decision Tree Collection Method in Data Mining

Data mining is a kind of work in the current commodity sales, database marketing, churn calculation for dividing customer groups, and credit scoring for fraud information detection, which can correspond to different implementation methods according to the data mined [6]. The critical goal of taxonomy is to derive a concise model or description method based on attribute values. This model can classify unknown data records and mark them with corresponding class labels. Currently, the most widely cited classification algorithms are Figure 1.

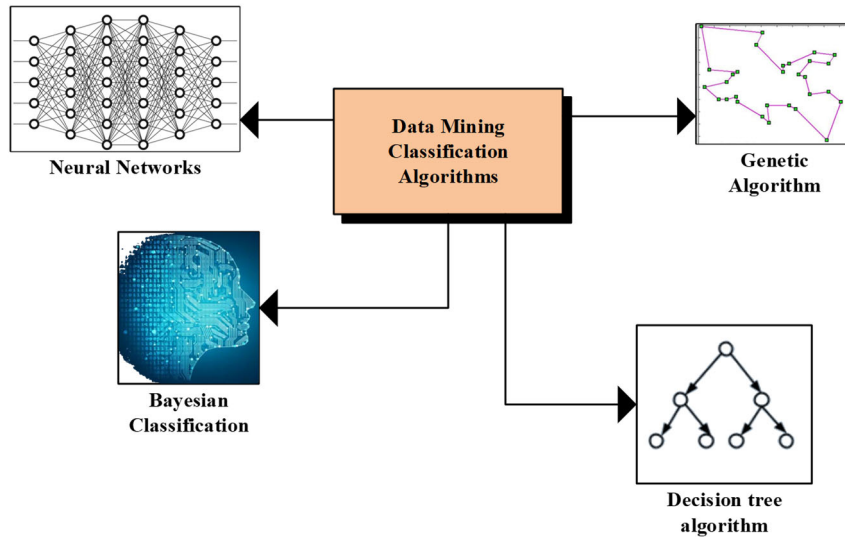


Figure 1. Commonly used data mining classification algorithms

In Figure 1, since the many advantages of the decision tree are shown in simple data form and simple calculation process, in the learning algorithm of the decision tree, how to simplify the model degree of the decision tree itself is a factor that needs to be considered. Suppose the model structure of the decision tree is too complicated. In that case, the advantages of the decision tree cannot be reflected, and the decision tree data mining method established from that place will be meaningless. The data calculation model is too simple, which will lead to an increase in the error rate of the data. Therefore, it is necessary to find a balance between the simplification of the decision tree and the accuracy of the data.

Assuming that there are A_1, A_2, \dots, A_n in a data set S , let C cover a total of $n+1$ attributes, and the classification attribute C includes m different discrete attribute values c_1, c_2, \dots, c_m that is to say, the data records in the data set S should be divided into m categories. Then assume that the data records in the data set S are s , and the classification attributes are c_1, c_2, \dots, c_m . The record data are s_1, s_2, \dots, s_m . The total entropy value of dataset S is shown in equation (1):

$$E(s_1, s_2, \dots, s_m) = -\sum_{i=1}^m p_i \log_2(p_i) \quad (1)$$

p_i is the probability of any record belonging to c_i , which can be estimated by s_i / s . The total entropy of the data set S is the weighted average of the information of different categories when dividing the data type [7]. Here, the data set S can be divided into a total of V subsets $\{S_1, S_2, \dots, S_v\}$ using the A attribute, and the total entropy of the data set S is the weighted average of the entropy values of the V subsets. At this time, the total entropy of the divided dataset S is shown in equation (2):

$$E(A) = \sum_{j=1}^m W_j^* E(S_{1j}, S_{2j}, \dots, S_{vj}) \quad (2)$$

W_j is the weight of the subset whose sequence is j , denoted by s_j / s .

2.2. The Innovative Resource Integration Theory of Precision Instruments

In adopting the inheritance of innovative resources, enterprises and institutions need to have careful system performance to achieve the integration effect of innovative resource data and transform output results. Therefore, when using high-precision instruments for data resource integration [8], the required characteristics are shown in Table 1.

Table 1. Characteristics of resource integration

Innovative resource integration features	Characterization
Complementary features	In the inheritance of resources, enterprises allow different types of resources. They need to pay attention to the complementarity of resources. Therefore, enterprises need to spend huge capital and human resources to ensure complementarity.
Structured features	In the innovative integration of resources, due to the design of many data types, it is necessary to classify different resource types to ensure a good layout and integration of core resources.
virtual features	The innovative resource integration will have some virtual characteristics. For example, resource integration is not to establish a new organization but to form a virtual organization to integrate resources.
Synergistic features	The innovative integration of resources will involve the cooperation of multiple agencies and departments. Therefore, good cooperation strategies are required between various enterprises and agencies to ensure resource integration.

When using precision instruments for resource integration, various objective factors will affect the integration efficiency.

Firstly, the precision instruments used in resource integration generally have the characteristics of small batches and high

prices. The types of resources that a single agency can handle are limited. Therefore, to expand the types of integrated resources that can be taken, some enterprises and institutions will support manual fusion to cooperate with instruments for integration [9].

At present, the precision instrument industry enterprises have a certain number of patents and intellectual property rights. However, enterprises are worried about their patents and intellectual property rights due to the imperfect laws and

systems for intellectual property and patent protection and the lack of a perfect, safe, and convenient sharing platform. It is challenging to protect innovative resources, only marginal technology patents are applied, and the secret technical system realizes the core technology. Therefore, the difficulty and progress of innovation resource integration in the entire industry have encountered enormous obstacles [10] in the initial stage. The current status of innovation resource integration can be described in Figure 2.

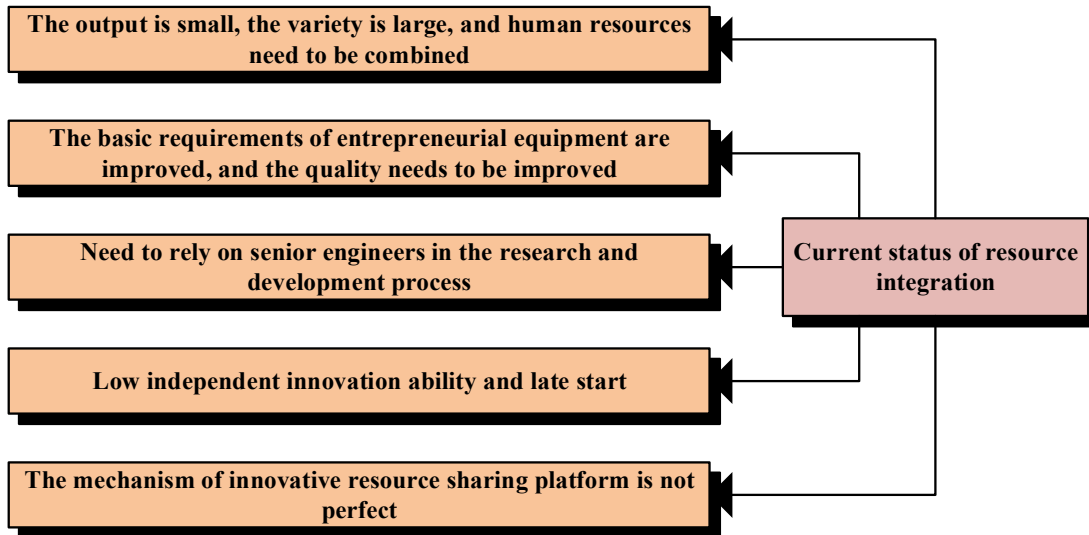


Figure 2. Factors in the current state of resource integration

2.3. Requirements for Resource Integration Combined with Computer System Functions

System requirements analysis is necessary to work and one of the essential steps in the development process. In the requirements analysis, the computer positioning system and the calculation of customer requirements can be used to accurately, clearly, and accurately determine the required data types. The overall design of the system is completed based on demand analysis. The modules generally required are system module, user module, instrument module, audit module, and security module [11]. The specific uses of the modules are as follows:

The system module is one of the core modules, which requires parameter configuration, database processing, and instant backup to complete loss recovery.

The primary purpose of the user module is to provide customers and users with the use unit of the instrument and equipment, including the user's registration, information management, instrument activation, instrument management, and reservation functions.

The instrument module includes applications for networking, information query, resource management, and fund project calculation.

The audit module is mainly used by administrators, including the audit of new user registration, new instrument networking, and other functions.

The security module is to ensure the system's network security, prevent network attacks, and prevent the risk of data leakage due to external reasons.

When using the computing function of the computer for resource integration, the non-functional requirements to be guaranteed are mainly three types: ease of use, reliability, and scalability. Ease of use means that the system needs to start from the actual situation and calculate the convenience of service according to users' requirements to avoid the phenomenon of large and empty. Reliability means that errors such as failures occur during the system integration calculation process to help it restore the initial state. The scalability is to achieve the update and development of system technology and instrument performance according to the changing needs of users [12] and ensure that the instruments and systems have a long-term service cycle.

3. Results

In the results section, the improved total entropy will be used to discuss the effects of various factors on the integration efficiency of instrument resources. The unit of total entropy is reflected in the load value, and the impact on the integration efficiency will be analyzed. At present, five factors are discussed: government subsidy, fiscal taxation, preferential strength of commodities, market financing of enterprises, and financial department planning of enterprises. After calculating the total entropy, it is drawn as a statistical graph for easy analysis. Its structure diagram is shown in Figure 3.

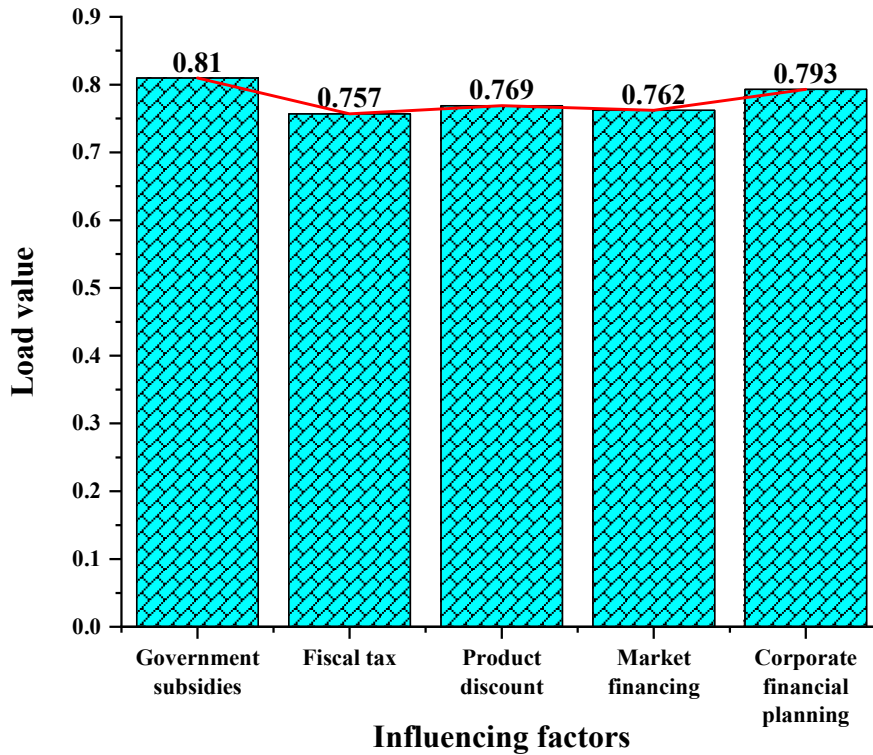


Figure 3. Analysis of factors affecting the resource integration efficiency of the instrument

In Figure 3, the impact load value of government subsidies on the resource integration efficiency of precision instruments is 0.81; the impact load value of fiscal taxation on integration efficiency is 0.757; the impact load value of commodity preference on integration efficiency is 0.769; the impact loading value of the enterprise's market financing on the integration efficiency is 0.762; the impact loading value of the enterprise's financial department planning on the integration efficiency is 0.793. Among these influencing factors, the government subsidy is the most influential factor for the integration efficiency, which shows that the government subsidy will directly impact the efficiency in the process of resource inheritance of the enterprise structure. The adequacy of funds for the construction of innovation resources of an enterprise guarantees the long-term stable innovation of the enterprise structure, and it is also the source of motivation for employees to improve work efficiency. Other influencing factors are mainly related to the preferential and subsidy of the financial department of the enterprise. Therefore, in the process of enterprise integration, experienced talent administrators are needed to make appropriate market investments, adjust salary strategies, improve employees' motivation, and achieve incentives to improve the efficiency of resource integration.

4. Conclusion

This study explores the factors that affect the efficiency of enterprise organizations' use of sophisticated instruments for resource integration. Firstly, the resource integration strategy of precision instruments is studied. A resource integration strategy is proposed based on a decision tree algorithm in data mining technology. It also expounds on precision instruments' resource integration strategy theory and discusses the internal relationship between resource integration strategy and data mining. The influencing factors are calculated and analyzed, which affects the resource integration strategy. After

obtaining the influence load values of the five influencing factors: government subsidies, fiscal taxation, commodity preference, enterprise market financing, and enterprise financial department planning, Government subsidies have the most significant impact on integration efficiency, and the remaining four factors are also related to working capital. Therefore, the enterprise structure should be improved appropriately to the information resources and information acquisition channels of innovation resource integration; an information resource sharing platform that adapts to the system should be built; three strategies of the financial department to motivate employees' work motivation are used to improve resources integration efficiency. Currently, the downside is that only five factors have been studied. The study scope will be expanded in the follow-up work, and more influencing factors will be investigated.

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