Research Article

Formation and Diffusion Analysis of Agricultural Product Brand Communication Influence Based on Big Data Fuzzy K-Means Clustering in Convergent Media Era

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In today’s society, with the support of information technology, the media is constantly developing in the direction of integration, which has a profound impact on all aspects of people’s social life. The brand of agricultural products is derived from the definition of brand, based on the differences of production areas, varieties and quality of characteristic agricultural products, and conveyed the information of characteristic agricultural products in the form of trademarks, certification marks, and product packaging. In order to solve the problems existing in the running process of brand promotion system of characteristic agricultural products, the concept of Internet of Things was introduced. The Internet of Things is a network that shows that objects and objects are connected with each other. Customers who use the Internet of Things can communicate and exchange information between any kind of goods. This paper focuses on the content of the improved K-means clustering model based on multibrand communication of agricultural products, expounds the analysis model and scope of agricultural product brand communication, applies the Internet of Things and related technologies to the brand promotion system of characteristic agricultural products, and simulates agricultural product brand communication by using big data fuzzy K-means clustering algorithm. Finally, the calculation of coincidence rate proves that the maximum distance between agricultural product brand communication influence and K-means clustering algorithm is consistent with theJC value of nodes, and the correct rate is as high as 90%. A communication mode that is more in line with the law of brand influence communication of agricultural products.

1. Introduction

With the rapid development of media technology, the impact of new media on society and business is gradually increasing. New media has become one of the main marketing methods in the contemporary market economy. New media has an important impact on the marketing channels, product added value and competitiveness, and brand positioning of agricultural products. In view of the current predicament in the marketing of agricultural agricultural products brands, it is suggested to improve the strategic position of agricultural agricultural products brands, cultivate professional talents, improve the new media platform, and extend the agricultural industry chain, so as to speed up the development of agricultural economy [1]. Under the influence of the new era of integrated media, it is imminent to expand new media to carry out better brand promotion of agricultural products. As a new form of media formed under the rapid development of information technology, financial media has profoundly affected all aspects of people's social life and has already demonstrated its many advantages and characteristics. Under this, there is also a new display of agricultural product brand communication. For this reason, financial media has also shown its characteristics as a comprehensive media form, mainly including: fragmentation of information, diversification of value, accuracy of audience, diversification of channels, fast transmission speed, cultural, and entertainment of communication content map. Agricultural product brand communication refers to the process in which the agricultural product brand
owner continuously communicates with the target audience through various means of communication and optimizes the process of increasing the agricultural product brand equity. In the context of convergent media, this paper attempts to discuss the specific agricultural product brand model in the convergent media era from the characteristics and requirements of convergent media, the main body and demands of agricultural product brand communication in convergent media, and the communication and requirements of agricultural product brands in convergent media era. The innovation and value adherence to the development of the agricultural product brand communication model in the fusion media era, that is, the problem of change and constant, so as to further explore the proper state of agricultural product brand communication in the fusion media era [2].

Big data is a collection of data that cannot be captured, managed, and processed by conventional software within a certain time frame [3]. It is an information asset with insight discovery and diversification, which can discover business opportunities through massive data analysis. Agricultural products are agricultural and forestry products or processed products that are produced in a specific area and have excellent quality or historical and human factors [4]. Based on the powerful functions of big data, the sales of agricultural products and the dissemination of their brands are inseparable from big data. Only by making full use of the advantages of big data can we increase the sales of agricultural products and improve the efficiency of brand dissemination.

With the continuous improvement and development of data collection and storage technology, countless databases have been involved in all application fields. The data in front of us are both a precious wealth and an invisible burden, so it is highly efficient in huge data sets. The digging out of the data that people need is imminent. With the special transition period of the economy, the competition between businesses is more intense, and the market analysis ability, risk control ability, agricultural product brand management level, and many other aspects need to be greatly improved, which requires agricultural product brand decision makers to make full use of data resources, so that data resources serve the development model of agricultural product brands [5]. Data mining is not only a simple call and query to the database but also a process of in-depth research and development after people deal with tens of thousands of databases for a long time. Data mining is to dig out unknown, novel, and potentially useful information and data from huge, fuzzy, random, and noisy data sets [6]. Data mining is a technology that spans a variety of disciplines, in which statistics, visualization technology, database technology, artificial intelligence, etc. all play an important role. The application of data mining technology to agricultural product brands can predict risks in the huge market, so that agricultural product brands can make correct decisions based on the key data excavated to avoid risks and greatly improve the competitiveness of agricultural product brands in the market.

The innovation of this paper: this paper is based on the influence maximization node selection of big data fuzzy K-means clustering. First, the network is divided into several nodes of uniform scale during the traversal process and then a candidate set is calculated in each subnet and combined with the node set with the largest degree in the network and the distance Jc value node set obtained in the process of graph traversal segmentation, select k nodes with the greatest influence from the set, and verify the overlap of the algorithm and the influence of agricultural product brand communication through experiments rate.

Section arrangement of this paper: the first section of this paper introduces the relevant scholars’ research on the big data fuzzy K-means clustering algorithm; the second section is based on the previous section research on the big data fuzzy K-means clustering algorithm. The third section is the analysis of the characteristics of the maximum distance Jc value of the fuzzy K-means clustering algorithm of big data and its coincidence rate with the spread of agricultural product brands is verified; the fourth section is the summary of the full text.

2. Related Work

Finding the best method to accurately and quickly determine the number of initial center points has always been a hot research topic in the K-means algorithm. In view of the fact that the K-means algorithm is easy to describe the data objects and has the characteristics of high efficiency and fast speed in processing data sets, it has been widely used in many fields. The difference between the research field and the application environment makes the clustering results often fail to achieve the expected results. Therefore, researchers have perfected and improved the algorithm and put forward many precious ideas [7].

Zhao proposed the RPCL algorithm, which uses the principle of characteristic analysis to establish the value function, so that the value of k can be automatically determined [8]. Kuang proposes the X-means algorithm by applying the Bayesian information criterion, which can obtain the optimal number of cluster center points [9]. Chen has shown through research that adding a new mechanism and changing the convergence speed of the objective function can also effectively avoid the situation of local optimal solutions [10] Chen uses the improved simulated annealing algorithm to avoid the random selection of the initial center by the K-means algorithm point, effectively avoiding the situation of local minimas [11]. Liu proposed a method based on particle swarm to optimize the cluster center points. This method can dynamically change the number of cluster center points, so that the final clustering result can obtain the optimal value [12]. Dangna obtains the optimal number of cluster center points by studying the intraclass distance and interclass distance and cites the distance cost function, which is finally verified by mathematical formulas [13]. The degree centrality heuristic and the proximity centrality heuristic proposed by Ping. The design of the degree centrality algorithm is relatively simple. The degree of the node is used to approximately measure the influence of the node. It is believed that the greater the degree, the greater the influence of the node. The proximity
centrality algorithm believes that the closer the average distance between a node and all other nodes in the network, the greater the probability of affecting other nodes. Therefore, the average distance between a node and other nodes in the network is calculated and sorted, and the K with the smallest average distance is the selected node [14]. Based on the degree centrality heuristic algorithm, Jin proposes a heuristic algorithm called degree discount algorithm for the independent cascade model. The algorithm believes that if a node has an active neighbor node, the degree of the node needs to be quantitatively discounted because of the overlapping influence between the two [15]. When Jie studied multidimensional data sets, he concluded that the optimal clustering results can only be achieved when both the objective function and the center point converge at the same time [16]. Kumar explored a method to automatically determine the k value of the cluster center point from the neural network by analyzing the objective function [17]. Yu proposed that distance can be used as a measure of similarity or dissimilarity between objects. Distance is a kind of dissimilarity with specific properties, which has the properties of three measures of non-negativity, symmetry, and triangle inequality. Because of its easy intuitive understanding and convenient operation, in the practical application of data mining mode, the common distance represents the similarity between objects, so as to cluster and classify the objects and other algorithmic processes [18]. Kumar proposed that the similarity between two objects is a measure of the degree of similarity between objects, and the degree of dissimilarity is a quantitative measure of the degree of dissimilarity between two objects. Generally speaking, similarity and dissimilarity the degree is between [0, 1], and the larger the value, the greater the degree of similarity or dissimilarity. Similarity and dissimilarity reflect two opposite definitions between objects, so they can naturally be transformed into each other through linear transformation and other methods according to the limited requirements of actual data analysis work [19].

Data collection requires a real-time monitoring system to realize the whole process quality traceability of agricultural products from production, processing to transportation, storage, sales and other supply chains, and finally form a new mode of agricultural product quality supervision and management with production records, flow traceability, information query, and quality traceability. Compared with the traditional data analysis, because the volume of data generation is small, data collection is carried out in a certain period. However, in the era of big data, data are generated in DB all the time. Therefore, if the data collection period is long, the value will be weakened. Then analyze the data and find the objective laws in the data through the appropriate data analysis model. Data analysis is the core of the concept and method of big data, which refers to the process of finding patterns, correlations, and other useful information to help decision making by analyzing massive, diverse, fast-growing, and real data. Based on the above literature, this paper makes the following summary on the communication influence of agricultural products brands, as shown in Table 1.

3. Principles of Big Data Fuzzy K-Means Clustering

3.1. Application Principles of Different Distances in Clustering Patterns. From the perspective to which the definition itself is applicable, distances such as Min’s distance and Lan’s distance can reflect the longitudinal or absolute differences formed by numerical features, so they are more used in numerical values to reflect differences and measure absolute distances. In the analysis of other similarities, the starting point of other similarities is to distinguish the differences from the direction and does not consider the absolute distance and then such distances are defined more for document data or for the similarity and difference of indicators. Using different distance formulas for the same object will lead to different conclusions in cluster analysis. In practical applications, an appropriate definition method should be selected according to the application scope and emphasis of different distance formulas, so that objective clustering results can be obtained on the basis of accurate definitions. An appropriate definition method of distance or similarity must be selected in combination with the cluster analysis method to be used [20, 21]. Distance is a key indicator in the clustering process. The process of clustering objects into classes is essentially a measure of the distance between objects. Therefore, the appropriate definition method of distance is also based on the selected clustering method.

Cluster analysis divides things into several categories according to a certain pattern, which can be based on the external similarity or internal similarity of things. Finally, the data set is divided into classes with larger similarity, but smaller similarity between classes, which makes the data within classes more similar. The steps of cluster analysis are shown in Figure 1.

First, perform a comprehensive scan of the data to be processed in the data set and treat each of the M data as one class, so that there are M classes in total; then the high-dimensional data are gradually reduced in dimension. Use the method of similarity measurement (usually Euclidean distance) to calculate the distance between each two data and combine the two types with the closest distance into one category according to the given features, so that the M-1 category is obtained; in the same way, calculate the distances between all classes are left, and the nearest two classes are again planned as one class; the cycle repeats until finally all similar data are classified into one class [22].

3.2. Clustering Data Structure. The database may contain a lot of data, and it may also have different attributes. Like other clustering methods, K-means clustering is based on the defined distance or similarity between objects. The definition of distance is to calculate the distance from any object to the centroid based on the centroid of each class. However, when selecting and determining the number of classes, K-means can only produce clustering results with a fixed number of classes. At present, there are many methods to determine the number of classes, that is, K, which can be determined
Research on brand contact point management for industry

Cut into the brand contact point from the perspective of management

Analysis of brand contact points from the perspective of new media

Analysis of the relationship between product quality and brand contact point

Brand contact point and enterprise crisis management

Research on brand contact point management and brand communication effect

Touch point management is to target those who have contact with consumers.

Closely related contact points are managed with emphasis, and the author bases on the service industry to explore the brand contact points in the service line.

Consumer centered, whether it is effect evaluation or communication strategy formulation, is centered on consumers and is considered from four aspects: time, place, scene, and situation.

According to the sources of consumers’ contact with brand information, it can be divided into three categories: one is the brand information of enterprises, the other is the brand reputation from social media, and the third is the experience of consumers’ participation in brand building.

As an important product contact point, through the improvement of product quality, better brand contact point management can be implemented, and the effective management of contact point can collect consumer feedback and other information, thus promoting the improvement of product quality.

the definition of the distance between objects is determined, the process of allocating an object to the nearest center is transformed into a process of comparing the distance between each object and the center and realizing the process of assigning according to the nearest distance.

The essence of the data matrix is to describe the structure of the data. n objects can be represented by m attributes, and the data matrix is represented in the form of n \times m matrix, as shown in formula (1).

\[
\begin{bmatrix}
    x_{11} & \ldots & x_{1f} & \ldots & x_{1m} \\
    \vdots & \ddots & \vdots & \ddots & \vdots \\
    x_{n1} & \ldots & x_{nf} & \ldots & x_{nm} 
\end{bmatrix}. \tag{1}
\]

The data matrix describes the relationship between objects and variables, while the dissimilarity matrix describes the relationship between objects and their structure. Many clustering algorithms are based on the dissimilarity matrix to study the data set, and the dissimilarity matrix is used to represent the difference between all the data objects stored in the data set. Assuming that there are n data in the data sample, the dissimilarity matrix is represented in the form of n \times n, as shown in formula (2).

\[
\begin{bmatrix}
    0 & d(2,1) & \ldots & 0 \\
    d(3,1) & d(3,2) & \ddots & \vdots \\
    \vdots & \ddots & \ddots & \ddots \\
    d(n,1) & d(n,2) & \ldots & 0 
\end{bmatrix}. \tag{2}
\]

\(d(x, y)\) represents the degree of difference between the object \(x\) and the object \(y\), and this degree of difference is expressed in terms of distance, so \(d(x, y)\) is a non-negative number. The smaller the distance, the more similar the objects are, and the larger the distance, the greater the
difference between the objects. The rows and columns of sample entities represent different entities, which is a data matrix; the rows and columns represent the same entity, which is a dissimilarity matrix. In the application of many clustering algorithms, if the rows and columns of the sample entities represent different sample entities, they must be converted to the same sample entities when storing the data set, that is, the dissimilarity matrix must be applied.

3.3. Selection of Objective Functions Based on Various Distances. The basic idea of K-means clustering technique is based on minimizing the clustering performance index. The clustering criterion function used is to minimize the sum of deviations from each sample point to the center of the cluster, or to maximize the similarity between each sample and the center of the cluster. For different clusters produced by two K-means clustering, the clustering method with the smaller sum of squared errors or the largest similarity is better [26].

The sum of squared errors reflects the sum of the distances between all objects and their centroids belonging to the class, that is, the sum of the errors of each point. Obviously, the smaller the distance is, the smaller the corresponding clustering result, as shown in (3).

\[
SSE = \sum_{i=1}^{K} \sum_{x \in C_i} dist_L(c_i, x)^2. \quad (3)
\]

Among them, \(dist_L\) refers to the L distance between two objects in Euclidean space, namely the Euclidean distance. \(C_i\) represents the ith cluster. The Euclidean distance formula is shown in (4).

\[
d(i, j) = \sqrt{(x_{i1} - x_{j1})^2 + (x_{i2} - x_{j2})^2 + \ldots + (x_{in} - x_{jn})^2}.
\quad (4)
\]

The Manhattan distance formula is shown in (5).

\[
d(i, j) = |x_{i1} - x_{j1}| + |x_{i2} - x_{j2}| + \ldots + |x_{in} - x_{jn}|. \quad (5)
\]

In formulas (4) and (5), \(i = (x_{i1}, x_{i2}, \ldots, x_{in})\) and \(j = (x_{j1}, x_{j2}, \ldots, x_{jn})\) represent data objects of two \(n\) dimensions.

For the Manhattan distance, the centroid that minimizes the objective function is no longer the mean of each sample point in the class, but the median of each point in the class. The objective function of Manhattan distance is the sum of absolute errors as shown in (6).

\[
SAE = \sum_{i=1}^{K} \sum_{x \in C_i} dist_{L2}(c_i, x)^2, \quad (6)
\]

where \(SAE\) is the centroid of the objective function and \(x\) is the mean of the sample function. Take the derivative of equation (6) and set the derivative equal to 0, as shown in (7).

\[
\frac{\delta}{\delta c_k} SAE = \sum_{x \in C_k} |C_k - x|, \quad (7)
\]

4. Contact Points and Characteristics of Agricultural Product Brand Communication Based on Internet of Things Technology

4.1. Analysis of Agricultural Product Brand Contact Point Structure Based on Internet of Things Technology. The Internet of things is a network formed by information interaction between things. Therefore, in the design process of the hardware system, the components of the Internet of things are mobile devices, servers, and communication networks formed by the two [27]. Big data technology has a wide impact on both academia and industry, and the field of brand communication of agricultural products is no exception. Big data technology is not a traditional database technology, but a new technical means. In this paper, the development direction of big data technology is summarized into six directions, which are data acquisition and preprocessing, storage and management, calculation mode, analysis and mining, data visualization, and data security. By classifying and analyzing the contact points of agricultural products brands, with the change of consumers’ behavior patterns, it is difficult for traditional database technology to monitor and evaluate consumers’ behaviors in real time, while big data technology can help enterprises realize the visual management of data. The contact point structure of agricultural products brand is shown in Figure 2.

Consumers have become the most critical link in the communication of agricultural product brands, and the support of consumers determines the reputation of an agricultural product brand. The participation experience of consumers includes the following four aspects: one is to disseminate the brand information of agricultural products, that is, consumers take the initiative to share the brand information of agricultural products to others in the form of word of mouth; the other is to provide agricultural product brand suggestions and provide agricultural product brand suggestions refers to consumers’ opinions on the development of agricultural product brands, the implementation of agricultural product brand strategies, and the construction of agricultural product brand images to help enterprises better improve agricultural product brand information; the third is to participate in the creation of agricultural product
brands and participate in the creation of agricultural product brands. The point is that agricultural product brands and consumers participate in the dissemination of agricultural product brands together, from the positioning of agricultural product brands to post-promotion, participation; participation in agricultural product brand sales means that consumers can help agricultural product brands achieve sales through social media platforms. After transformation, consumers will become firm defenders and agents of the agricultural product brand, and consumers will also form an agricultural product brand community linked by common values to jointly maintain the growth and development of this agricultural product brand.

Consumers become the leaders of the media, that is, the main force in the generation, processing, and dissemination of information carried by the media. Consumers are no longer just passive recipients, but become an indispensable link in information dissemination. Without consumers, there is no information. The fission-type spread of agricultural products and the contact points of agricultural products brands are infinitely enlarged due to the change of consumer roles. The needs of consumers to use the media are based on their own value. Therefore, in the process of dissemination of agricultural product brand information, only the core value contained in the dissemination information is consistent with consumer values can it attract the attention of consumers and can be recognized by consumers and left to continue to disseminate. Other agricultural product brand information and forms may be filtered by consumers. This change in the information of agricultural product brands will also lead to changes in the connotation of agricultural product brand contact points.

4.2. Visualization of Clustering Influence of Agricultural Product Brand Communication. With the diversified development of today's economy and the great strides in computer storage performance, the previous methods of recording and researching economic data are no longer applicable to the analysis and mining of big data in today's economic industry. Use the electronic label, bar code technology, sensor network, mobile communication network, and computer network in the Internet of things technology to realize the brand traceability of agricultural products. Consumers can query agricultural product producers and quality and safety-related information through electronic touch screen and mobile phone with bar code identification system and can also find out more detailed quality and safety information of agricultural products through online inquiry. Especially in some industries, economic data have a development trend that cannot be ignored in both the time dimension and the cross-sectional dimension, and panel data are widely used in the recording and analysis of economic data because it has both time and cross-sectional data information.

In this section, based on the evaluation method of the clustering degree of agglomeration and the degree of separation of the prototype, the above-mentioned method and the traditional K-means clustering method are applied to the sample at the same time, and the clustering analysis is carried out. Get the clustering results and briefly describe the results. Cohesion is defined as the sum of the similarities of all points within a class to the centroid of that class, while separation is defined as the sum of the centroid similarities between different classes. From the perspective of similarity, the greater the similarity between the sample points within the class and the centroid, the greater the degree of cohesion, and the smaller the similarity between the centroids between classes, that is, the greater the degree of separation; and from the perspective of distance, the smaller the sum of the distances from each sample point in the class to the centroid, the greater the cohesion within the class, and the greater the distance between the centroids between the classes, the
greater the separation between the classes, the greater the degree of agglomeration of a clustering result within the class, and the greater the degree of separation between the classes, the better the effect of the clustering method, so this part is based on the idea of the degree of agglomeration and the degree of separation. The agglomeration degree and separation degree of the two clustering methods were calculated by the method of intraclass and interclass distance.

This experiment first adopts a relatively regular data set. The data set has a total of 212 data objects, including three distinct clusters of the same size, and the differences between each cluster are obvious. Use the maximum distance to automatically generate the $k$ value algorithm and the original K-means algorithm to cluster the data set 10 times. The original K-means algorithm will get 4 kinds of clustering results, and the other three results are wrong. The idea of distance makes the distance between the selected initial centers far away and avoids taking the data objects in the same class as the initial centers, so the data set can be correctly divided into three categories, and the error square sum criterion function $J_c$ is used to evaluate the two. Whether the algorithm is good or bad, the smaller the $J_c$ is, the more convergent the function is, and the better the final clustering result is. First, the original K-means algorithm is used to cluster the data set 10 times, and the results are shown in Figure 3.

The $J_c$ value obtained by the original K-means algorithm will change, and the $J_c$ value of the algorithm that automatically generates the $k$ value algorithm can not only avoid relying on the setting of the $k$ value when processing the data set but also can better process the data set, so that it can be obtained correctly the clustering results.

The data set in this section contains 287 data objects, and the main feature is that each cluster is an irregular extension. The data set is clustered using the maximum distance automatic generation $k$ value algorithm and the original K-means algorithm, and several clustering results are obtained. The maximum distance automatic generation $k$ value algorithm is used to cluster the data set. Due to the large differences between classes, the error sum of squares criterion function $J_c$ is used to test the correctness of the clustering results. Figures 5 and 6 show the size of the 10-time clustering results $J_c$ of the maximum distance automatic generation $k$ value algorithm and the original K-means algorithm.

As can be seen from Figures 5 and 6, the maximum distance automatic generation $k$ value algorithm for this irregular specific data set only has three errors when clustering, and the correct rate is 90%; using the original K-means, the algorithm only got the correct clustering results 6 times, so it can be concluded that the algorithm of automatically generating the $k$ value of the maximum distance is more suitable for this kind of irregular data set than the original K-means algorithm.

Since the K-means algorithm randomly selects the initial cluster centroids, it will inevitably lead to unstable clustering results obtained by the algorithm. Sometimes isolated points are selected as the initial centroids for iterative calculation, but the clustering results are incorrect. This paper avoids the phenomenon of multiple centroids in the same class by using the basic concept of the maximum distance algorithm and choosing the distance between the initial data objects as much as possible. But some classes have no centroids. Based on this, we propose the idea of
coordinate rotation to obtain the initial centroid, which makes the clustering result stable and can avoid the local optimal situation well.

Different agricultural product brands combine their own resources to formulate subdivision methods that conform to their actual conditions. Therefore, there are many methods of market segmentation, but in general, they can be classified into three types. First, the single factor method: this method is that agricultural product brands only consider one of the most important factors to make market planning, and there are many conditions that can generate market segmentation factors, which makes it possible to have a standard to regulate, so that a better overall market can be made. Nice division: the criteria for market segmentation are generally summarized in the following categories. First, based on geographic area, the natural environment in which each consumer lives is different, which definitely has a great impact on the market orientation. For example, the size of the city and the level of development must be taken into account when making market segmentation for agricultural product brands. Second, based on population: the income, occupation, age, and other personal factors of the population play a crucial role in the development of agricultural product brands. For example, for high-income people, an agricultural product brand needs to sell high-quality, high-priced, and high-quality services to these people, while for low-income people, if this service is provided, it will definitely make the agricultural product brand waste a lot of resources.
Third, based on psychology: to open a new market, we must fully consider the psychology of consumers. For example, sports brands will conduct psychological tests on people of all ages whether they love sports. Fourth, based on behavior: behavior is the ultimate manifestation of a consumer, and it is the factor that most directly reflects market dynamics. Therefore, when agricultural product brands segment the market, they should conduct research on why consumer groups buy this product, how much they like the brand, and so on. These subdivision standards will change with changes in social productivity. Agricultural product brands need to find out the standards suitable for their own development based on the standards of this market segmentation to determine their marketing strategies.

4.3. Clustering Coincidence Rate of Brand Influence of Agricultural Products. The data in the data set have already reflected the information of the most influential nodes in the whole agricultural product brand. According to the results obtained by the nodes, we can know that the more you get, the greater your influence in the community, so you can get the node set of the data set. When the influence of nodes is known, the combination of known nodes is used as the comparison set, and the mixed propagation model, independent cascade model, and linear threshold model are, respectively, used to select the node set with the greatest influence from the data and compared with the known node set. If the repetition rate between the set obtained by a certain propagation model and the node set of the known set
is the highest, then the propagation model should theoretically be the model that most conforms to the actual propagation law.

The K values of the nodes are taken as 50, 100, 150, 200, 250, 300, 350, 400, 450, and 500, respectively, and the corresponding sets of nodes with the greatest influence can be found in the data set. The corresponding sets obtained by the hybrid propagation model, the independent cascade model, and the linear threshold model are obtained, and the coincidence rates of the propagation results obtained by the three propagation models and the actual standard set are compared. The coincidence rate of the data set under the three propagation models is shown in Figure 5, where H represents the hybrid propagation model, IC represents the independent cascade model, and L1 represents the linear threshold model.

It can be seen from Figure 7 that with the increase of the K value, the coincidence rate of the influence range of the nodes also gradually increases, and for the same K value, the coincidence rate of the influence range corresponding to the hybrid propagation model is always greater than that of the other two types. Model: it is proved that the maximum distance between the influence of agricultural product brand communication and the K value clustering algorithm is consistent with the JC value of the node, and the correct rate is as high as 90%. The target of dissemination of agricultural products must be positioned in layers. In a new consumer market, there are the public, various niches, and the elite at the top of the pyramid. At present, many agricultural products are only aimed at the mass market or the regional market of origin, and the consumption objects are vague. In fact, each ethnic group has its consumption, and each ethnic group has its contact points. We should pay attention to grasp the different relationship between each ethnic group and the media and adopt different communication strategies accordingly. Communication contact points and propagation mode. When an agricultural product brand faces the public, it must rely on scale to win. From the perspective of the brand premium of agricultural products, it is necessary to target very individual niches.

5. Conclusions

In this paper, brand contact points are analyzed by big data technology, and the spread of agricultural products brands is simulated based on big data fuzzy K-means clustering algorithm. Finally, the coincidence rate calculation proves that the maximum distance between agricultural products brand spread influence and K-means clustering algorithm is consistent with the JC value of nodes, and the correct rate is as high as 90%. A communication model that is more in line with the law of brand influence communication of agricultural products. In the practical background of big data, the current development trend of big data is put forward, while in the mining mode part of big data, this paper mainly introduces several data mining modes based on describing tasks and predicting tasks. In order to further study the practical value and application scope of data mining, this paper selects one of the models-clustering model for concrete and in-depth understanding and application, focusing on the content of the improved K-means clustering model based on multibrand communication of agricultural products, and elaborates from the analysis model and scope of agricultural product brand communication, the research results of existing K-means clustering model based on agricultural product brand communication, and the main ideas and steps of the method applied in this paper. With regard to the proposed improvement, the definition of agricultural product brand communication distance and the steps of clustering have been changed compared with the existing research results, in order to make it more applicable to the data type of agricultural product brand communication. Under the guidance of agricultural product brand strategy, agricultural product brand advertising is a continuous advertising campaign with the core of spreading the core value of agricultural product brand, aiming at shaping the brand personality of agricultural products, and communicating with consumers. Aiming at the fixed consumer groups, it leads consumers' awareness to the preconceived level of consciousness through continuous advertising. The core value of agricultural products leads the direction of advertising development and influences the thinking of advertising creativity. Advertising creativity is characterized by continuously shaping the individual impression of agricultural products brands and continuously injecting fresh vitality into agricultural products brands. It is the essential difference between brand advertisement of agricultural products and product advertisement to shape the brand impression of agricultural products and achieve the communication effect.

The brand communication mode of agricultural products based on the Internet of things is not perfect. A complete IOT application chain has not been formed in the industry. At present, only some enterprises apply IOT technology, which makes the interior very loose. In addition to using the online promotion platform, the agricultural product industry also needs to start from the quality of products, improve the quality of products, realize the regional positioning of agricultural product brands, improve the advantages of agricultural products, and improve the brand effect of agricultural products while providing high-quality products to consumers. In the actual research, according to the characteristics of sample data and the needs of users, there are different clustering algorithms and models, which are not specifically introduced in this paper. In the future research, we can conduct detailed research and study on different clustering models. As for the clustering mode in data mining, the methods proposed in this paper still need to be improved and developed, such as the selection of class number K and the evaluation of clustering ideas and steps of the method applied in this paper. With regard to the proposed improvement, the definition of agricultural product brand communication distance and the steps of clustering have been changed compared with the existing research results, in order to make it more applicable to the data type of agricultural product brand communication. Under the guidance of agricultural product brand strategy, agricultural product brand advertising is a continuous advertising campaign with the core of spreading the core value of agricultural product brand, aiming at shaping the brand personality of agricultural products, and communicating with consumers. Aiming at the fixed consumer groups, it leads consumers' awareness to the preconceived level of consciousness through continuous advertising. The core value of agricultural products leads the direction of advertising development and influences the thinking of advertising creativity. Advertising creativity is characterized by continuously shaping the individual impression of agricultural products brands and continuously injecting fresh vitality into agricultural products brands. It is the essential difference between brand advertisement of agricultural products and product advertisement to shape the brand impression of agricultural products and achieve the communication effect.

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Data Availability

The data used to support the findings of this study are included within the article.
Conflicts of Interest
The authors declare that they have no competing interest.

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