Entrepreneurial Bricolage Based on Big Data and Artificial Intelligence Decision-Making

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After entering the new century, the rapid development of information technology has brought a huge impact to traditional social life, which has also triggered drastic changes in the production environment of enterprises. As long as we seize the opportunity of the development of the times, we will quickly accumulate huge wealth. Some new types of companies have surpassed traditional large companies with decades of history in a short period of time, which makes entrepreneurship very attractive. At the same time, the state has also given strong support to people’s entrepreneurship, encouraging capable people to start their own businesses in terms of policies and funds, which has stimulated a wave of entrepreneurship among the people. However, due to the short period of time for the construction of China’s market economy system, the vast majority of new ventures cannot obtain sufficient resource stock to grow and develop and can only turn to the external market to seek opportunities for development. Entrepreneurial bricolage has become a “keyword of the times” in recent years under this background. Previous studies have shown that entrepreneurial bricolage has a relatively positive effect in alleviating the plight of enterprise development resources, and many new ventures regard it as an important way to obtain development resources. The development of big data and artificial intelligence decision-making provides more possibilities for information sharing and personalized analysis and also gives new ventures more opportunities to choose development resources that suit their own characteristics. However, from the actual situation, it is obvious that Chinese enterprises have not achieved very obvious results in how to make full use of big data and artificial intelligence decision-making technology to improve their entrepreneurial and bricolage capabilities. Based on the technical support provided by big data and artificial intelligence decision-making, this research studies the entrepreneurial bricolage activities of China’s new ventures in this context, through the questionnaire survey and tracking analysis of 135 enterprises established in the two provinces from 2015 to 2020. After comparative analysis of a large amount of data, it is found that enterprises that combine big data and artificial intelligence technologies can obtain more high-quality resources and make more informed decisions in the process of starting a business. It can be concluded that the companies that have excellent application of big data and artificial intelligence decision-making technology have more opportunities to obtain ideal resources in entrepreneurial bricolage. The study conducted an in-depth analysis of the problems of China’s new ventures in entrepreneurial bricolage and put forward suggestions for improvement based on the specific conditions of this type of enterprise. It is hoped that it can help start-ups to realize the alleviation of resource constraints.

1. Introduction

The arrival of the era of big data has revolutionized the industrial structure of society. More than in the past, society values and relies on the holistic use of information. The essence of big data is the aggregation of complex data. Its basic mode of operation is the collection and processing of information. Of course, the way big data technology collects and processes information is different from general data processing technology. The data collected through big data technology can be sorted into valuable information in the hands of professionals, and the analysis and sorting of the
collected data can also greatly improve the decision-making ability of managers. The role of big data in organizational management, decision-making, and operation determines its practical value, and this value will continue to deepen and innovate. Its impact on organizational management has also become a symbol of the era of big data.

Artificial intelligence (AI), in other words, is the realization of the human brain’s thinking capabilities through computers, including perception, decision-making, and action. The current commercialization of artificial intelligence is mainly based on computer vision, intelligent voice, data processing, and other technologies, and it has corresponding products or services in accounting and other fields. The development of artificial intelligence decision-making can be divided into three processes. It is initially the initial stage of development: the concept of artificial intelligence was first proposed, and then, many related achievements such as “machine theorem proving” and “checkers program” were researched, making the technology more advanced. The development has reached a new height: the stage of stable development—with the development and popularization of the Internet, new ideas and research and development of artificial intelligence have been further promoted, making artificial intelligence decision-making develop in a more practical direction: the stage of rapid development.

The “entrepreneurial bricolage” theory was first proposed by an American scholar, and it is an entrepreneurial theory with high practical value obtained through empirical research on nearly 30 companies. Its core is to emphasize that “opportunities are discovered” and propose that new ventures will inevitably encounter the dilemma of resource constraints. If you correctly understand the existing resources in your hands and maximize their value, it will be helpful for alleviating the resource dilemma and seeking new development. Opportunity plays a very important role. From here, we see the three most critical nodes of entrepreneurial piecing together: existing resources, timing of action, and resource integration. In other words, advocates of entrepreneurial bricolage theory argue that the dilemma of resource scarcity faced by enterprises is relative. As long as a scientific solution is found, the existing resources can be presented in a more valuable way. Entrepreneurial bricolage covers a wide range, and production materials, production technology, and related customers can all be used as bricolage objects. With the wide range of entrepreneurial bricolage, it is inevitable that the composition of the object resources of the bricolage is complex and it is difficult to accurately locate it. This situation also increases the difficulty of in-depth analysis of entrepreneurial bricolage and summing up successful experiences from it. Most of the scholars who studied entrepreneurship in the past did not combine the two technologies of big data and artificial intelligence for analysis. Compared with previous scholars, this paper also has different research methods. For example, this paper uses the questionnaire survey method to participate in the actual. In the process of enterprise entrepreneurship, we conducted a detailed survey of enterprises using artificial intelligence and big data. In addition, the analysis of the use of the new technology in this paper is not available in the previous research by scholars.

For the first time, Audretsch et al. gave a systematic overview of the relationship between regional cultural identity and implicit and explicit entrepreneurship across the United States. In order to make a direct comparison of regional cultural identities, they applied the American country and bricolage community-type method, focused on analyzing the scientific connection between entrepreneurial activities and entrepreneurial spirit, and explored the spatial characteristics represented by different cultural regions through big data analysis. Their research uses counties as a unit to compare data with nearly 3.5 million U.S. residents [1]. From the research results, it is concluded that the entrepreneurial culture reflects the dynamic interaction between the cultural characteristics of the region and its latent and obvious entrepreneurial spirit [1]. Setiawati and Kurniasari’s research is relatively specific. Through a case study of how colleges and universities can effectively use nonorganic waste to cultivate students’ entrepreneurial spirit, it is proposed that the local government should play a bridge role, optimize the use of resources, and explore cooperation between all parties [2] and ways to benefit from it and to improve stability and business continuity and ultimately will increase the living standards of local residents through taxation and wages. The research shows that with the spirit of cooperation and win-win situations between the student members and the surrounding residents, there will be results for the realization of entrepreneurial bricolage. Research has found that the school members and the local community have a high entrepreneurial spirit [3]. Through effective cooperation, organic waste is made into socially usable plastics and quilts, achieving the goal of “turning waste into treasure.” The research of Lai started from the theory of resource bricolage, emphasizing the important value of this theory for regional innovation [4]. He believes that new ventures in China are facing serious resource dilemmas at this stage, such as poor information symmetry, poor resource sharing awareness of entrepreneurs, and market environment that needs to be improved, and put forward suggestions to alleviate these difficulties, such as building an integration mechanism as soon as possible, building a large-scale resource bricolage network, building a resource bricolage platform for new ventures, and enhancing entrepreneurs’ resource bricolage awareness [5]. Yu and Chen believe that building a vertical innovation system through a diversified and subdivided incubation model to deal with redundant resources in the traditional sense can provide help for the development of enterprises, especially in helping enterprises to obtain instant advantages [6]. However, the research in this area has not made a significant breakthrough, and in the process of studying the existing literature, they found that the relationship between redundant resources and instantaneous competitive advantage has not been paid enough attention by scholars. They creatively constructed a positive U-curve model between the two and put forward valuable suggestions for the construction of the resource information sharing platform [7].

Although after China’s reform and opening up, the total economic volume has increased by geometric multiples; the economic benefits and development environment of small-
and medium-sized enterprises have not been significantly improved [8]. Almost all start-ups are faced with financing difficulties and severe competition for resources. In addition, the lack of scientific resource-sharing awareness of corporate managers has led to their inability and lack of subjective initiative to carry out related actions for entrepreneurial piecing together, thus losing. There are many opportunities for development and growth. In order to better promote the Chinese government’s decision to encourage entrepreneurship and innovation, make big data and artificial intelligence decision-making technology better serve our economic development, efficiently realize the goal of “resource complementary and green development,” and relieve China’s new ventures. The resource dilemma can better help the development of new ventures under the premise of limited consumption, so this research was carried out [9].

2. Big Data and Artificial Intelligence Decision-Making

2.1. Big Data. Big data can also be called a huge amount of data. It refers to a collection of information that has reached a prescribed volume or more and involves a complex area that cannot be analyzed and processed by traditional analysis tools in a short time. If you want to use such a dataset to help your work, you need more powerful analysis capabilities, faster calculation speeds, and a more optimized selection process. Only in this way can we accurately grasp the needs of customers in the shortest possible time under the background of the ever-increasing volume of information. From here, we can know that big data is very different from ordinary data collections. The huge data volume is only the premise, and the capture of the key parts of the data is the center.

Big data has three progressive conditions. The first is that there must be enough data to support it; that is, data related to the subject must be stored regardless of whether it appears on the surface. This level explains the premise of big data. The second is to filter out various data related to target customers on this basis. For example, for telephone shopping, only information about the field of information terminals is useful, and the rest of the information can be ignored at this time. This level is the technical level; that is, the analysis and classification of the original data will gather the useful information of oneself. The third is the capture of core data. Through the customer’s past habits of using information terminals, it can help customers choose a more suitable model to choose. This condition is also the key to testing the ability of big data analysis. Several main features of big data are shown in Figure 1.

2.2. Artificial Intelligence. Artificial intelligence has a very close relationship with knowledge, so people usually describe it as expressing knowledge-acquiring knowledge-using knowledge. At the same time, some scholars have proposed that from the perspective of its use, contemporary artificial intelligence is “using information terminals to replace humans to complete tasks that previously required talents.”

According to the latter view, artificial intelligence can be divided into “artificial” and “intelligence” coming from two fields. The former refers to the equipment manufactured by humans, and the latter refers to the high-level intelligence possessed by humans. In other words, human beings create an information device with advanced intelligence to replace themselves to complete some very complicated tasks. In the current stage of artificial intelligence equipment design, there are two main ideas, namely, the structure simulation and functional simulation of the human brain. The former derives the artificial neural network algorithm, which is the most outstanding result of the structural simulation of the human brain in the contemporary era. The most common of the latter is computer equipment.

2.3. Construction of the Artificial Intelligence Decision Model

2.3.1. Workflow of the Artificial Intelligence Decision Model. After entering the information age, human data analysis and data mining are usually done by information equipment, and then, humans make decisions based on the results of data analysis. However, with the continuous development of human life, the intersection of various fields of society has
become more and more in depth, and the volume of data collection and the degree of analysis required have become more precise. The original single decision-making process is connected to form a chain containing multiple decision-making units. At this time, if the decision is made by humans in each decision-making unit, it will inevitably lead to the entire decision-making due to the personal preferences of the decision-maker. The process has undergone a major deflection. Artificial intelligence decision-making is produced and continuously developed under such demand. It can make final decisions based on established analysis and selection procedures without waiting for human instructions, thereby efficiently linking data collection to decision-making actions, making unattended, fully automatic processes a reality. The workflow of artificial intelligence decision model is shown in Figure 2.

Here are a few application examples to show the contemporary application of artificial intelligence decision-making, as shown in Table 1.

### 2.3.2. Construction of the Algorithm Model

Entropy is often used to measure the degree of confusion of a system or model. Here, we try to make the target into a broader set $A = \{B_1, B_2, C_1, C_2 \cdots \}$ (where $B$ and $C$ are of different types); the core idea of this method is to divide this set and sort the elements in it; if the inside of a certain type is composed of $B$ and the inside of another type is composed of $C$, then the order of this dataset can be considered to be relatively clear, and the value of entropy is almost 0.

$$F(\theta) = \sum_{i=1}^{k} h(\theta_i) \log \frac{1}{m(\theta_i)}.$$  \hspace{1cm} \text{(1)}$$

### 3. Research Design

#### 3.1. Determination of the Sample

This study conducted a questionnaire survey and follow-up analysis of 135 companies in two coastal provinces established between 2015 and 2020. In the process of designing the questionnaire, in order to ensure the quality of the questionnaire, to ensure and strengthen the objectivity and authenticity of the data obtained, the production of the questionnaire has gone through a number of demonstrations and tests, which guarantees the scientific nature of the questionnaire to a large extent. In the process of distributing the questionnaire, carefully check the identity of the person who filled out the questionnaire to ensure that the enterprises serving the survey sample were issued 400 copies of the questionnaire.

In the process of distributing the questionnaire, care was taken to ensure that enterprises serving the survey sample were issued 400 copies of the questionnaire. After the questionnaire was recovered, the reliability of the questionnaire was tested by the variance experiment. After the test, it was proven that the reliability of the questionnaire result was higher than the specified value, and the homology deviation ratio was not obvious. Industry and quantity of sample enterprises is shown in Table 2.

#### 3.2. Variable Measurement

The test scales used in this research have been selected and verified in detail, and some adjustments have been made according to the actual situation. Then, use the five-level scoring system to analyze various indicators. In terms of specific classification, this questionnaire sets contentment decision-making as 3 questions and improvisation as 3 questions. At the level of opportunity development, balance and innovation are both set to 3 questions. At the entrepreneurial performance level, 3 questions were also set, with a total of 15 questions as the backbone of the questionnaire. In addition, there are 5 questions about the nature of the company’s products, the number of employees, and the length of time the company was founded. There are 2 questions in the whole article. See Table 3 for the composition and quantity of entrepreneurship questionnaire.

The reliability test of this questionnaire adopts Cronbach’s $\alpha$ coefficient test method for in-depth comprehensive evaluation. The results show that the overall reliability of the questionnaire is 0.883, among which the reliability values of entrepreneurial bricolage, opportunity development, and entrepreneurial performance are all above 0.824, which can be concluded that the internal reliability of the questionnaire is quite high.

### 4. Results and Discussion

#### 4.1. Results

#### 4.1.1. Enterprise Managers Have a Big Contrast in Their Entrepreneurial Awareness of Bricolage, and It Is Difficult to Realize Their Willingness to Bricolage

Although the entrepreneurial bricolage model has very important value for the development of new ventures, it is found in the
questionnaire survey that a considerable proportion of managers are still relatively weak in entrepreneurial bricolage [9]. Some of them are out of troublesome mentality, and some of them suffer from the lack of a piece of partners and have to do everything by themselves. This phenomenon is very detrimental to the development of new ventures [10]. The survey shows that if companies have a demand for bricolage and seek help from other companies, only 43.78% of them can successfully achieve bricolage, which is still less than 50%. Such a low success rate of bricolage will not only interfere with the development plan of the enterprise but also involve a lot of the energy of the enterprise managers, making them unable to be at ease in the development of the enterprise.

According to Figures 3 and 4, it can be seen that the entrepreneurial bricolage recognition of entrepreneurship is currently in a developing stage, and only 58% of people are in a relatively normal state of recognition. From another point of view, more than 60% of people are unwilling to participate in partnership bricolage, and entrepreneurial bricolage needs to be further promoted in the future.

4.1.2. Lack of a Unified and Efficient Bricolage Information Platform. Entrepreneurial bricolage service is a brand-new term for Chinese enterprises and the government. How to better build this service model is still being explored. The imperfection of the market economy system has caused the managers of start-up companies to be full of alertness to the market, fearing that cooperating with unfamiliar companies will cause them to suffer losses. The premise of entrepreneurial bricolage is trust and reciprocity [11]. The survey shows that the vast majority of start-ups at present can only contact companies that have done business cooperation or business dealings when they are willing to put together. Bricolage among unfamiliar companies rarely occurs. This is because Chinese corporate managers seldom resort to the psychological habit of strangers, and there are also reasons why cooperation information cannot be accurately and timely transmitted to other companies [12]. Construction of entrepreneurial bricolage platforms in two provinces is shown in Table 4.

4.2. Discussion

4.2.1. Unify Thinking and Enhance Cooperation Awareness. The development of big data and artificial intelligence technology has provided a solid foundation for start-ups to start businesses. If new ventures fail to seize the opportunity for development and concentrate resources on major tasks during the empty window of market commodities, they will even more strain the already relatively embarrassing development momentum of the enterprise [13]. It is recommended that the managers of new ventures actively change their minds and strengthen their understanding of the importance of entrepreneurial bricolage and the mode of operation, to survive the resource dilemma in the initial stage of entrepreneurship with a spirit of unity and enterprising. This will not only save development resources for the enterprise but also make some partners and provide more ideas for the future development of the enterprise.

4.2.2. Establish a Unified Bricolage Information Platform as Soon as Possible. In order to alleviate the problem of poor communication among start-ups in resource patching, it is recommended that the government come forward to build an information exchange platform for enterprise startup bricolage and conduct stricter qualification audits for enterprises entering the platform. Companies on the platform are prohibited from using deceptive means to infringe the interests of other companies and accept complaints from people from all walks of life. If the facts of the complaint are established, the platform will impose administrative penalties on the relevant companies. For companies that pass the platform qualification review, they need to pay a certain amount of security deposit to the public account first, and the corresponding security deposit is handed over to the

Table 3: The composition and quantity of the questionnaire survey on entrepreneurial bricolage.

| Title attribution | Subdivision type | Number of questions |
|-------------------|------------------|---------------------|
| Natural situation | Control variable | 5                   |
|                     | Contended decision | 3                   |
| Entrepreneurial bricolage | Improvise | 3                   |
| Opportunity development | Balanced opportunity development | 3                   |
|                     | Innovative opportunity development | 3                   |
| Entrepreneurial performance | Without | 3                   |

Figure 3: Level of recognition of entrepreneurial bricolage.

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government for supervision [14]. Every time an enterprise successfully participates in a bricolage activity, it will get a certain number of points. After the points reach the specified amount, it can be rated as a credit enterprise for bricolage, and the deposit will be refunded. This enhances the trust of mutual assistance and cooperation between enterprises, so that they can use the information platform to relieve their own resource pressure with confidence.

5. Conclusion

In the context of big data and artificial intelligence decision-making, Chinese enterprises are more dependent on contextual factors in the process of entrepreneurial bricolage. Factors such as institutional rules have a more important impact on the survival and development of new ventures. China’s strong advantages in big data analysis provide strong support for the start-up of start-ups. With such a solid technical foundation, the leaders of China’s new ventures must actively change their thinking and actively seek resource-sharing enterprises, so that enterprises can more steadily cope with resource dilemmas in the development stage. Local governments must also take the initiative and act as intermediaries for enterprise entrepreneurship. In addition to building a resource sharing platform, they should also strengthen cooperation between governments, eliminate local protectionist ideas, and build an entrepreneurial support system that “lights management and emphasizes service.” Increase the training of resource management talents and relieve the pressure on talents at the level of professional managers. In this way, the depth and breadth of the resources of new ventures will be promoted in many ways.

Big data technology can make rapid analysis based on various datasets of enterprises and individuals and can make decisions that are conducive to entrepreneurial bricolage based on the comprehensive collection of a large amount of messy data. Artificial intelligence technology can simulate human behavior based on dataset training. With judgment and operation, start-up companies can first establish the database required for big data and artificial intelligence analysis and then put various demand data into the database, which can be used to screen out entrepreneurial bricolage decisions and then combine artificial intelligence judgment methods to intelligently screen out the most excellent solution. This study selected 135 new ventures established in two provinces between 2015 and 2020. After comparative analysis of a large amount of data, it is found that enterprises that combine big data and artificial intelligence technologies can obtain more high-quality resources and make more informed decisions in the process of starting a business. Therefore, the conclusions of the research still need to be further verified for the matching of the long-established mature enterprises. This is also the focus of the next step of this research.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

It is declared by the authors that this article is free of conflict of interest.
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