Research on the Clarinet Music Based on Big Data

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Abstract. The clarinet was evaluated by the famous composer Mozart as the instrument closest to the human voice. It is more active in the expression of music and occupies a certain position in the performance of the symphony. With the development of the social economy and application of information technology, big data technology is gradually integrated into every aspect of life. It will change people's behaviour mode, thinking method and value concept, and it is bound to affect the inheritance, innovation and development of world music culture in the future. Starting from the background of the era of big data, this paper briefly introduces the meaning of big data and clarinet performance characteristics, and discusses the application of big data technology in music research in detail, to provide a reference for future music research.

Keywords: Big Data, The Clarinet, Music

1. Introduction
The clarinet is one of the western wind instruments. Clarinet's performance presents a variety of melodic characteristics, euphemistic and plaintive melody, rich playing techniques, flexible and varied dynamics so that its performance has a strong artistic appeal[1-2]. In order to be recognized by the audience, the players need to master complex performance skills and accurately express the clarinet's musical art by overcoming the difficulties of performance technology, which requires the players to have a certain cultural background.

Big data theory was proposed by Victor Meyer Schoenberg Kenneth in his book, the age of big data, in 2008[3]. They believe that big data analysis does not need a shortcut like random analysis, but USES all the data for analysis. At present, the world has entered the cloud era, and the amount of data storage has been growing explosively[4]. The growing data means new opportunities, and the big data theory will inevitably be pursued by The Times[5]. Big data is widely used. The Big data has become a hot spot in the development of new technologies. Massive and diversified information makes big data need a new processing mode to provide new and effective information for users, and make decisions more accurate[6]. In March 2016, the outline of China's 13th five-year plan was released, in which it was proposed to "take big data as a basic strategic resource, fully implement the action, accelerate the opening up and development and application of data resource sharing, and facilitate industrial transformation and upgrading and innovation of social governance"[7]. Therefore, the
application in the study of music discipline has certain theoretical significance and practical value.

![Figure 1. World big data market value estimation in 2011-2018(in millions RMB)](image)

2. The meaning of big data

It has the basic characteristics of huge data Volume, diverse data types, fast processing speed and low-value density, which can also be explained by "4V": Volume, Velocity, Variety and Veracity. Therefore, "big data" is a data set composed of a large number of complex structures and a large number of types of data. It is a data processing and application model based on cloud computing, and it is an intelligence resource and knowledge service capability formed by cross-reuse and integration and sharing of data. For example, during the APEC meeting, big data will be used to analyze the weather, tourism, culture, food and other relevant information to facilitate the formulation of travel plans.

In contrast, music big data is still relatively scattered, so it must be sorted out on different terminals. Data in big data can be divided into two types: first, static data structure. The so-called static data structure refers to the migration from paper documents to digital documents in digital work; The second is human interaction, which I call dynamic data structures. That is to say: when paper documents are transferred to digital documents and static data structures are constructed in the era of big data, human beings focus on the interaction of culture or other human activities in the digital era. When the static data structure interacts with the dynamic data structure, people will have a complete data source for the analysis of the whole process mode of society or human activities and even the new lifestyle. Data can help to deepen scientific research, transmit more relevant experience, and enable computers to predict the direction of researchers' research, research dynamics, and so on. Of course, the insights provided by the data are constantly evolving. When more data are available, the analysis results will be different for different music content. Therefore, data alone is not enough. For traditional music culture, the key is to find out the hidden insights of music big data and analyze, utilize and mine the data.

3. Technical requirements in clarinet playing

Music performance must master skilled performance skills, clarinet performance should be more so, how to show the beautiful and rich timbre requires long-term training of players, not only to understand and master the knowledge of playing skills, but also in combination with the player's body movements and create a musical situation.

3.1. Master the rhythm technique

Music is an art form that attaches importance to the sense of rhythm. When clarinet is played, the rhythm should be a smooth whole. Once the rhythm is wrong and the chapter connection is wrong, the
integrity of performance will be destroyed. On the contrary, a good command of rhythm makes the performance smooth, graceful and natural. Therefore, what the players need to pay attention to is the rhythm and speed of the performance, and play the beat carefully and master the speed, or leisurely and slow, or passionate generosity, fast and slow rhythm control or slow, or fast, should be adjusted according to the specific situation. Also, it is necessary to master a sense of rhythm. When you are fully engaged in the performance process, your body and soul will fly with the rhythm of the music and reach a state of harmony between the rhythm of the music and your body and mind.

![Figure 2](image)

**Figure 2.** The schematic diagram of Clarinet articulations

3.2. **Master finger operation technology**

The flexibility of the fingers on each sound hole is related to the performance of musical notes. Therefore, the basic requirement of finger movement is to be orderly, fast and flexible, and to be able to move and perform flexibly, which is pleasing to the eye. The performer should first be familiar with the finger movement technique and control the movement of fingers with his mind. The reaction of fingers should be sensitive and the intensity should be moderate, so as to achieve the natural fluency of the whole playing process.

4. **Application of big data in music research**

In the digital age, various digital resources are increasing exponentially. People "write" the trajectory of all kinds of big data, permeating every corner of life. The continuous emergence of various databases objectively constitutes a huge "cloud" database. In fact, innovative means and methods can be provided for various database applications and requirements, so that the collection, sorting, induction, summary, and analysis of digital resources can be fully utilized. This is the important enlightenment that big data brings to us. The application of music big data mainly USES the music knowledge from various disciplines as the background. The combination of big data and music data explores a more scientific way of big data analysis and mining. Taking traditional music as an example, the big data is used to lay a foundation for the inheritance and development trend of traditional music. As the traditional music data can comprehensively and truly reflect and present the characteristics, development status and rules of things, the data-based decision is generally more objective, scientific, effective and reasonable than the decision made entirely based on personal experience and intuition. Therefore, data and digitization of existing music cultural resources are also part of big data.
4.1. **Analysis of music ontology**

Traditional Music data exists in isolation, and its Music data is one-sided, so the perception of big data for the future cannot be predicted. Therefore, big data needs to build a system of Music Ontology and its cultural ecosystem. Music ontology provides a vocabulary for connecting a wide range of music-related information. Anyone can publish data based on the music ontology and connect to other existing data to eventually create a music-related semantic web. After the completion of the music ontology architecture, the massive music information resources published by it can be collected and sorted out by users effectively and generate interactive behaviors. The author thinks that music ontology is the specification of music big data. Only through the knowledge structure of the music ontology domain can the correlation relationship and value service system of the music big data be excavated. Through the knowledge structure in the field of music ontology, it is also possible to analyze and study the relevance, semantics, heterogeneity, reorganization and other valuable music information resources of music big data.

4.2. **Analysis of music teaching**

Music big data can not only analyze the content of music ontology, but also analyze the music teaching. Therefore, in the process of music teaching, how to excavate resources and discover information presents a new opportunity for music researchers.

From the perspective of classroom analysis, the main dimensions involved include teachers and students. Its purpose is: in the music classroom, the teacher's teaching process, teaching skills, teaching methods, as well as the classroom performance of students to do data collection and description, the use of big data analysis, access to teaching control and reflection, feedback students in learning deficiencies and other problems to be solved. Through music big data research and analysis, is clear about the student's personality, interests, cognitive, and learning methods and habits, such as the related data, to meet the teacher to the students' learning and understanding ability, to improve teaching methods, teaching strategy in time, make the teaching more targeted, which provide a new paradigm for the traditional music subject of science teaching. For example, teachers will analyze the traditional music courses, which students may be interested in, according to their preference for a certain type of traditional music. And teachers will reflect on other relevant courses.

4.3. **Music social interaction**

Big data can be applied to many entertainment fields, such as combining social and music. According to reports, 300Entertainment will work with Twitter to develop software that will analyze Twitter's trove of music-related data, including comments on various musical works and artists. Twitter will also provide non-public information, including the location of users' posts. The results of the data analysis will be provided to music artists, music companies, as well as help Internet users discover new singers and works. At the same time, through the traditional music study of individual social behavior statistics, analysis of the current research content in the period of the trend and trend; It can also be analyzed according to the consumption behavior of researchers, such as the share of traditional music and popular music, and the age distribution of users. Through the quantitative
investigation and analysis of massive data, the relationship between variation and receptivity of traditional music is separated.

5. Conclusion
The future value of big data is immeasurable. It has become a resource that will restructure our society, application and management. In short, the application of traditional music big data is a combination of computer science, culture and ecology, anthropology of music, education, cartography, statistics, sociology, psychology, and other areas of interdisciplinary research ideas and methods. It will make traditional music research more targeted, for the application of teaching and scientific research work to solve practical problems, and finally work out effective policies to promote the development of traditional music. The traditional music discipline should strengthen the digital processing of traditional music resources collection, arrangement, labeling, and the description of resources, to provide the possibility for researchers to develop and utilize the future of each meeting point of the big data of music.

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