

Applications of Two-Dimensional Bar Codes and Face Recognition Technologies in the Management of College Student Archives

Ling Ling Lu¹, Yong Wei Yang², Yong Zhao Wang²

1. Faculty of History and Archaeology, Anyang Normal University, Anyang, China
2. School of Mathematics and Statistics, Anyang Normal University, Anyang, China

Abstract

The two-dimensional bar code technology is widely used in college student archive management systems and has achieved very good results. However, we found that the student identification module in the college student archive management system based on two-dimensional bar code technology requires students to register online to provide too much identity information, and can not check whether the registrants who obtain the student status information are students themselves. In view of the above problems, this paper first analyzes the problems existing in the management of the traditional student archives, and the application value and demand of the two-dimensional bar code technology in the student archives. Combining with the characteristics of the management of college student archives, it is pointed out that the current two-dimensional bar code and face recognition technologies are more suitable for the management of college student archives. The architecture of student status file information management system based on two-dimensional code and face recognition technologies is studied, and the functions of each subsystem are designed.

Keywords: college student archive management; two-dimensional bar code technology; face recognition technology

1. Introduction

With the wide applications of computer and Internet technology, the modern society has gradually stepped into the era of rapid development of information technology, especially the continuous improvement of the emerging technology such as two-dimensional code (QR) and face recognition, make people from the traditional society into an intelligent society. Face recognition, also known as human image recognition technique for image detection and tracking using computer face recognition algorithm, is usually carried out by means of a camera to collect human face images or directly analyze data information containing face images (or video streams). Face recognition technology has the extremely widespread applications: the application of active face capture technology in security systems in high-speed railway stations, subway stations and other occasions to arrest criminals can assist the public security system; in civil aviation, payment and other fields, the identification can be achieved directly through face recognition, and the efficiency and accuracy are relatively reliable. Two-dimensional bar code is a black and white rectangular pattern which uses 0 and 1 to simultaneously express and record the data symbol information in both horizontal and vertical directions. It can express a large amount of information in a very small area, and the image input device or photoelectric scanning device can automatically read the information stored inside it, thus realizing the automatic processing of the information (Guo Y, et al., 2018).

As a new cross media communication technology, two-dimensional bar code can effectively connect file information and mobile terminal. It has been widely used in retail, manufacturing, logistics, book file management and other industries (Li, 2018). At present, many scholars use the two-dimensional bar code design student archive management system, however, students required to register online student identification module provides the identity of the information too much. In addition, other people can access to the recognition system as long as they have the identity information of the parties. Therefore, the current student archive management system, which only relies on the technology of

two-dimensional bar code, has brought many advantages, but also brought about the hidden security trouble of the student archive information at the same time. Combined with the characteristics of college student archives, this paper designs a set of student archive management system based on two-dimensional bar code and face recognition technology. The application of this technology will greatly improve the quality and level of the management of student archives.

2. Problems Existing in the Traditional College Student Archive Management

College student archives are records of the life, study and various social practices of students during the school period in colleges, which have obvious periodicity, dispersiveness, dynamic and comprehensive (Liu, 2018). College student archives are the important guarantee for the normal operation of college teaching and students' management, which is the main basis for students' employment and future employment and assessment. The problems exist in the traditional archives management of college students are as follows:

2.1 Lack of Standardization in College Student Archive Management Systems

In many colleges and universities, there is an irregular phenomenon in the archives management mode. The archives of documents belong to the management of the party office, while the management of student archives belongs to the academic affairs department, and the separate management mode affects the standardization of the student archive management, and also buries hidden trouble for the safety of student status files (Sun, 2016).

2.2 Lack of Modern Management Methods for College Student Archives

At present, many college student archive managements are still in the traditional manual management mode, without the modern information technology, and file access must be one piece to go through the archival materials. With the expansion of student archives, the management mode of manual flipping can not only not meet the needs of users, but also make the management of student archives have more repeated work and lower efficiency (Guo, 2018). It is a great obstacle to the efficient use of archives.

2.2 Lower Utilization Ratio of College Student Archives

Because of the manual management mode, the management and development of college student archives are basically at the stage of simple collection and collation of materials, and lack of deep information processing of student archives. Most colleges and universities only treat the management of student archives as an administrative work, which obviously ignores the effectiveness and value of the management of student archives (Xuan, 2017).

3. Advantages of Two-Dimensional Bar Code Technology and its Application Value in College Student Archives

3.1 Advantages of Two-Dimensional Bar Code Technology

Two-dimensional bar code technology has many advantages in data storage and information transmission, mainly manifested in:

(1) The diversity of storage formats. Two-dimensional bar codes can be stored both horizontally and vertically. They can encode pictures, sounds, words and other forms of information in a digital manner, and can represent a variety of languages and words (Yang, 2016).

(2) High density coding and large information storage capacity. A single two-dimensional bar code can solve the problem of preserving a large number of files. One-dimensional codes can normally store only 30 or more characters, while a single two-dimensional bar code can hold up to 1,850 uppercase letters or 2,710 digits or 1,108 bytes or 554 Chinese characters, its storage capacity is dozens of times of the one-dimensional code.

(3) Two-Dimensional bar codes have a high level of fault tolerance and a very strong error-correcting function. In the process of application of two-dimensional bar codes, if there is defacement,

perforation or dislocation, and the local information will be damaged, but as long as the damaged area is not more than 50%, it can be read correctly. If the degree of damage is between 50% ~ 70%, the correct recognition rate can reach 95%, which is helpful to improve the integrity of archives preservation.

(4) two-dimensional bar codes are low cost, easy to make and not overly dependent on databases. Two-dimensional bar codes can be printed on ordinary paper or other materials. There are many storage formats and storage capacity of the two dimensional bar code. In general, the two dimensional bar code can satisfy the information resources needed by the user, and can obtain the required information only once without calling the remote database. Therefore, the degree of dependence on the database is greatly reduced.

3.2 Application value of Two-Dimensional Bar Codes in College Student Archives

The main content of the two-dimensional code technology is to combine different information technologies such as virtualization, automation and intelligence into a set of innovative design schemes, so that the intelligent management platform of archives can be transformed into a service-oriented platform to improve the utilization of archival information resources. The application value of two-dimensional bar codes in college student archives is as follows:

(1) Two-dimensional bar codes can improve the efficiency of student archive managements. Due to the different carriers of modern student archives, there are many kinds, large quantities and complicated levels, so it is difficult for the traditional management mode of student archives to unify and efficiently manage them. With the help of two dimensional bar codes, the image, text, fingerprint, signature and other information of student archives are digitally coded, and displayed and preserved in the form of bar codes. It effectively improves the utilization rate and management efficiency of student status files (Zhao, 2018).

(2) The two-dimensional code technology provides a new way of information dissemination for college student archives. In the traditional management system of college student archives, the inquiry and utilization of student status archives resources need to go to the student archive office to read the relevant materials, which is easy to be restricted by time and space. In today's society, the combination of two-dimensional code technology with other networks and modern information means of mobile communication can break the limitation of region and time, and meet the needs of the society and audience in the new era for archives management work, it provides a new mode of communication for student archives, which can greatly improve the efficiency of the use of archives.

(3) The two-dimensional code technology can promote the development and utilization of archival resources. In the management of college student archives, most of archives are idle because some of them are not suitable for opening up or they are not the status of archives that the public really needs. The application of two-dimensional code technology to student archives management can make information diffusion more convenient. The student archive management department should give full play to the interactive function of the two-dimensional code technology in the student archive management, and adjust the personalized service of the two-dimensional code according to the public's demand for the student status files, so as to improve the accuracy and utilization rate of the archives resources (Zhu, 2016).

(4) The two-dimensional bar code technology is helpful to improve the accuracy of file query in colleges and universities. The introduction of two-dimensional bar code technology can maximize the use of information resources in the student archives and narrow the distance between users and the information service platform of student archives. The uniqueness of the two-dimensional bar code can ensure the accuracy of the student record file information. The error correction function of the two-dimensional bar code in the code system can quickly correct the wrong information and greatly improve the accuracy of the query of the student record file.

4. Analysis of Demands of Two-dimensional Code Technology and Face Recognition Technology in the Management System of College Student Archives

University graduates usually have the following purposes for the use of student archives: (1) After graduation, some students in colleges and universities need to provide the household registration information of the students in the college archives department to change the household registration. (2) For college students to go to other colleges to further study and study abroad, they will need the college's archives department to provide the student's transcripts during school, and then use it as a basis for creating new files and applying for scholarships and grants. (3) Graduates may also experience the phenomenon of lost diplomas due to various factors, and they must prove their education level to the work unit when they are employed or at work. Therefore, the archives are required to provide their academic status.

According to the purpose of the use of the student record files by different graduates, the college student records management department should provide targeted services to students and establish a student archive management system based on the technology of two-dimensional bar code and face recognition. On the one hand, it can effectively improve the work efficiency of the archives, but also meet the different needs of graduates for student records. Therefore, the new student archive management system should have the following functions: (1) Graduates can use the network and mobile medias to fill in and register their own information, and then the college student archive system will generate the corresponding two-dimensional bar code and return it to the college student after the student archive system completes the verification check. (2) Graduates can use their two-dimensional bar codes to identify themselves and obtain their own student records at any time. (3) The two-dimensional bar code should store the complete basic information of the graduates. At the same time, it should also store hyperlinks to some of the websites. These hyperlinks link to the roster of enrollment in the graduate student records, academic transcripts, and graduation certificate verification information.

5. Design Scheme of College Student Archive Management System Based on Two-Dimensional Code and Face Recognition Technologies

The new student archive management system is mainly based on the B/S framework mode. At the same time, it also needs to consider that users use different intelligent terminal systems to access the system and establish a corresponding WAP site. The system mainly covers the following modules in the design process:

(1) The digitization and information input module of student archives. Digitization requires that student status file administrators scan different types of student records and save them in the form of pictures. At the same time, important student information such as student names, student numbers, majors, ID numbers and face images are entered into the system to facilitate the retrieval of student records. The core content of the digitization and information input module is to construct the database and provide the information input interface. Then the student register manager can directly input the latest student status data information into the database.

(2) The student identification module. The establishment of a student identification module is a key step for students to self-check students' status information. By building a digital information platform, students can create individual student status information files through online registration which meets students' needs for information on student records, and improves the work efficiency of college student status file management. The on-line registration of college student records and the creation of school-status information should be based on the student number and face image as identification information, and the system information verification should be conducted according to the student number provided and the face image collected. After the information is correct, the student archive management system automatically generates a two-dimensional bar code and sends it to the student. The dimensional bar code not only needs to retain the basic information of the students, and it should also have certain hyperlinks. Through the two-dimensional code, students can also view the transcripts, graduation certificates, and degree certificates.

(3) The two-dimensional bar code generation module. All QRCode codes developed and applied in the college student record management system should use C# and Qrcode to generate

two-dimensional bar codes and save students' required student status information into two-dimensional bar codes. The system automatically sends the two-dimensional bar codes to the mobile phone used by the student for registration through a text message or a WeChat platform.

(4) The two-dimensional code analysis module. After receiving the QR code sent by the system, the students use mobile phone, tablet computer and other scanning to read the information in the two-dimensional bar code. The information includes the student's student number, year of enrollment, graduation year, graduation certificate and degree certificate code, etc. It also provides hyperlinks to allow students to self-check the academic performance of each school year during the school period. Students can save the relevant information after the completion of the query and print it out.

Acknowledgement

The works described in this paper are partially supported by the Chinese Overseas Communications Ministry Collaborative Innovation Center-Study of Chinese Character Culture, Higher Education Key Scientific Research Program Funded by Henan Province (No. 18A110008, 18A630001) and the 2017 Teaching Research Project of Anyang Normal University (No. ASJY-YB-047).

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