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Design and Implementation of Personnel Recruitment System in Higher Vocational School

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Abstract: With the rapid development of information and network technology, the traditional personnel recruitment work in schools no longer meets the needs of the times, and it is urgent to develop a school personnel recruitment system to improve and optimize the recruitment work of personnel departments. The author designed and developed a school personnel recruitment system based on PHP technology and MySQL database technology using B/S architecture. The system design is scientific and reasonable, simple and easy to operate. It realizes the paperless operation of personnel recruitment, reduces the recruitment error rate and improves the recruitment efficiency. The two-way real-time communication is realized in the recruitment process and the needs of our school's Double High-levels construction and the 14th Five-Year Plan construction for talent recruitment are met. After the test and trial run, the system functions are normal and stable, which can better meet the needs of the school personnel recruitment work informationization.

1. Background Analysis

The Double High-levels construction plan of our university points out that "systematically implement the plan of talent introduction and training, and build a teaching team led by famous teachers, with reasonable structure and classified development". The school also proposed that "abreast of introduction and training, optimization of the structure of faculty staff", "to introduce talents in the form of open recruitment, school and enterprise bilateral employment, project-based employment and flexible introduction". Personnel recruitment is one of the important links in our university's talent introduction plan and optimization of faculty structure. However, the personnel recruitment system has received relatively less attention than the "pioneers" of digital campus construction such as student management [1], teaching management [2] and personnel management system [3-6]. At present, our university still adopts a more traditional approach to recruitment, which has the following drawbacks.

1.1. Ineffectiveness of Repetitive and Cumbersome Work Process and Work Content

The general process of personnel recruitment in our school is that the school publishes recruitment information, and the job seekers know it online and send their resumes by email to

personnel recruitment staff responsible for recruitment, download the electronic resumes, sort them, check the information, and conduct preliminary review. After screening and statistical operations, then the preliminary review results will be issued. After the applicant passed the qualifications review, he/she pays the fee at the specified time. The recruiter in charge conducts qualification review again, develops a pass for those who pass the review. Those passed the qualification review print the pass and take the exam, etc. The whole recruitment process is complicated and tedious. The recruiters put a significant amount of effort in the qualification review and the production of the pass, which inevitably causes a lot of workload and inefficiency for the recruiter when there are more applicants.

1.2. The Recruitment Process Creates a Lot of Paper, which not only Causes Waste of Resources, but also Makes It Easy to Make Mistakes

During the recruitment process, a large number of application forms, resumes, honors and other supporting materials need to be copied and backed up, resulting in a waste of paper and funds, and in addition, manual operations such as resume sorting, qualification review, screening statistics and production of pass cards are prone to errors.

1.3. Two-way Communication Inconvenience between the Recruiters and Candidates in the Recruitment Process May Cause the Delayed Message Delivery

During the recruitment process, the person in charge of recruitment need to contact the candidates frequently and send notices, such as: the preliminary qualification notice, qualification review notice, written test notice, interview notice and so on. These notifications are generally released through the official website, and applicants are required to check the results themselves at the specified time, and if they have questions, they can only ask by calling the reserved phone number of the recruiter. The lack of timeliness of information transmission and the inability to communicate with each other in real time has caused great inconvenience to the candidates.

In the background of such rapid development of information, our school urgently needs to realize the informationization of personnel recruitment work. Although there are some professional personnel recruitment systems in the market [7-10], they are either complicated to operate or not adapted to the characteristics of school personnel recruitment. The cost of purchasing and maintaining the software is also high for the university. In order to meet the needs of personnel recruitment in our school and to meet the recruitment needs of the school's Double High-levels construction and the 14th Five-Year Plan, it is necessary to design and develop a personnel recruitment system according to the specific conditions of the school.

2. Demand Analysis

There are four types of school recruitment: There are many types of recruitment and complicated processes for career staff recruitment, assessment recruitment, non-career staff recruitment and labor dispatch recruitment. We organized students, led by teachers, to interview relevant staff of the personnel office to fully understand their needs, and analyze and organize the needs to form functional user requirements, and then confirm them with the staff responsible for recruitment to ensure consistency in the understanding of the needs between the two sides.

Based on the results of the survey and the relevant technical conditions, the functions that need to be implemented in the school personnel recruitment system include the following.

2.1. User online Registration Function

2.1.1. Administrator Posting Job Information

The administrator can post multiple job offers in the same time period.

2.1.2. Users fill in the Registration Information

Users fill in the relevant information according to the recruitment requirements and upload supporting documents mainly including ID card, graduation certificate, degree certificate, academic registration form of the Ministry of Education on the CHSI website, title certificate, other testimonies (party membership certification materials, award certificates, work certificates, proof of agreement to apply, etc.).

2.1.3. Backstage Generation of User Registration Form

Table 1: Application registration form

<table>
<tr><td colspan="8">Chongqing City Vocational College open recruitment of career staff registration form</td></tr>
<tr><td colspan="2">Position</td><td colspan="5"></td></tr>
<tr><td colspan="2">Name</td><td></td><td>Gender</td><td></td><td>Year of birth</td><td></td><td rowspan="4"></td></tr>
<tr><td colspan="2">Ethnicity</td><td></td><td>Political appearance</td><td></td><td>Marriage or not</td><td></td></tr>
<tr><td colspan="2">Work time</td><td></td><td>Familiar language/what level</td><td></td><td>Computer proficiency</td><td></td></tr>
<tr><td colspan="2">Place of origin</td><td></td><td>Current address</td><td colspan="2"></td><td>Phone number</td><td></td></tr>
<tr><td colspan="2">Email</td><td></td><td>ID number</td><td colspan="2"></td><td>Height</td><td></td></tr>
<tr><td colspan="3">Current work unit and position</td><td colspan="5"></td></tr>
<tr><td colspan="3">Academic and technical qualifications or professional qualifications</td><td colspan="5"></td></tr>
<tr><td colspan="2" rowspan="2">Education Degree</td><td>Full-time education</td><td></td><td>Graduation institution and major</td><td colspan="4"></td></tr>
<tr><td>On-the-job education</td><td></td><td>Graduation institution and major</td><td colspan="4"></td></tr>
<tr><td rowspan="5">Education and training experience</td><td colspan="7">(Fill in from the time of study in college or junior college)</td></tr>
<tr><td>Starting and ending years</td><td colspan="4">Institution and major</td><td>Academic degree</td><td>Full-time / On-the-job</td></tr>
<tr><td></td><td colspan="4"></td><td></td><td></td></tr>
<tr><td></td><td colspan="4"></td><td></td><td></td></tr>
<tr><td></td><td colspan="4"></td><td></td><td></td></tr>
<tr><td rowspan="5">Work (practice) experience</td><td colspan="7">(from the time of participation in the work to fill in the present, the time should be continuous)</td></tr>
<tr><td>Starting and ending years</td><td colspan="4">Work unit, department, position</td><td colspan="2">Work content and main performance</td></tr>
<tr><td></td><td colspan="4"></td><td colspan="2"></td></tr>
<tr><td></td><td colspan="4"></td><td colspan="2"></td></tr>
<tr><td></td><td colspan="4"></td><td colspan="2"></td></tr>
<tr><td colspan="8">Note: The main performance class is accompanied by additional materials to explain</td></tr>
</table>

According to the registration information filled by users in the front-end, the user registration

form (Table 1) is generated in the back-end, which can be downloaded and printed directly by the administrator.

2.2. Application Information Management and Review Function

2.2.1. Administrator Manages Registration Information

Administrators can delete, batch export and batch import user registration information.

2.2.2. Review Function

The administrator can add reviewers, who can review the registration information item by item and batch review.

2.2.3. User Change Information Function

Users who have not passed the review can modify the registration information, but there is a time limit, which is determined by the administrator; users who have passed the review will not be able to modify the registration information.

2.2.4. User Payment Function

Users passed the review can use Alipay or WeChat to make payment. After successful payment, warm tips for the subsequent process will appear. The content of the tips can be edited by the administrator.

2.2.5. Pass Management

The system automatically generates the pass number according to the rules set by the administrator according to the payment status. At the same time, the pass page is automatically formed at the front end, and the paid users can view and print their own pass after logging into the system.

2.2.6. Results Management

Administrators can batch import users' exam results, and users can view their own results on the front-end.

2.2.7. Group SMS

According to the actual situation, the administrator can send SMS notifications to users in different time periods such as auditing pass, payment deadline reminder, written test, qualification review, audition, interview and physical examination.

3. Overall System Design

3.1. Functional Design

The system is divided into front-end and back-end after conducting analysis, with the front-end user being for the applicant and the back-end user being for the school's responsible recruiter, i.e., the administrator. Figure 1 shows the specific functional structure.

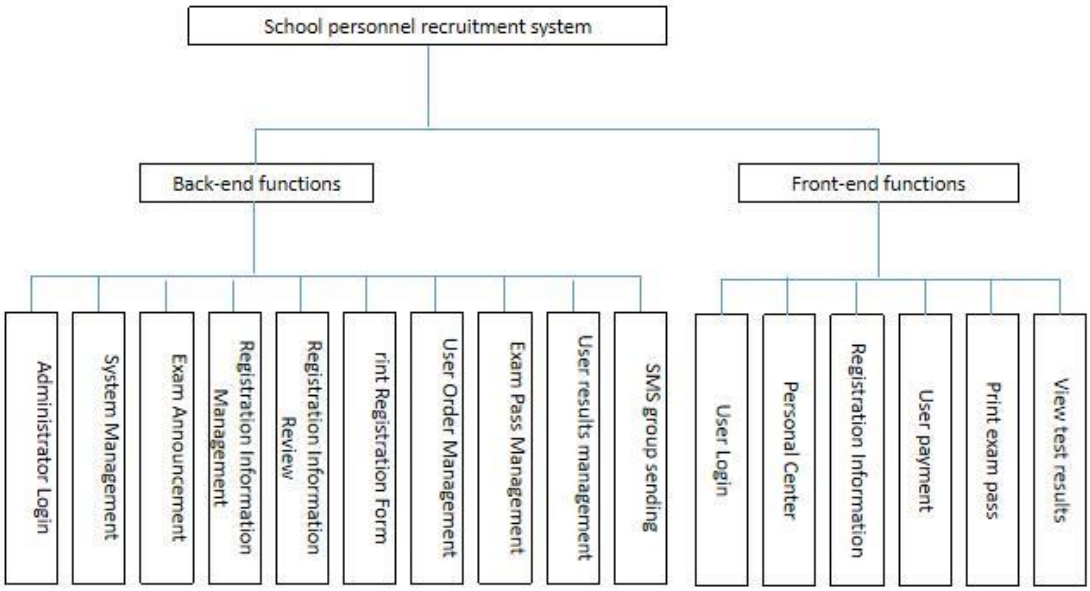

Figure 1: Functional diagram of the school personnel recruitment system

3.2. Database Design

The system database mainly contains 6 tables, including exam information table, user information table, registration information table, order information table, pass information table and result information table.

3.2.1. Exam Information Sheet

The exam information form contains exam information such as exam ID, exam name, instructions to candidates, registration deadline, review deadline, payment deadline, and registration fee. Figure 2 shows the exam information sheet.

3.2.2. User Information Form

The user information table contains important information such as user ID, name, ID number, phone number, password, etc., where the phone number is the user account number. Figure 3 shows the user information table.

3.2.3. Registration Information Form

The registration information form contains registration information such as registration ID, basic user information, political appearance, academic degree, time of participation in the work, and job qualifications. Figure 4 shows the registration information form.

#	Name	Type	Sorting order	Attribute	Null	Default	Comments
1	id	bigint		UNSIGNED	No		ID
2	uuid	char(50)	utf8mb4_unicode_ci		No		UUID
3	title	char(50)	utf8mb4_unicode_ci		No		Exam Name
4	exam_instructions	longtext	utf8mb4_unicode_ci		Yes	NULL	Notice to Candidates
5	admission_ticket_prefix	char(50)	utf8mb4_unicode_ci		Yes		Pass number prefix
6	apply_instructions	longtext	utf8mb4_unicode_ci		No		Application Instructions
7	start_apply_time	datetime			No		Default start time of registration is creation
8	end_apply_time	datetime			No		Closing deadline
9	end_audit_time	datetime			No		Review deadline
10	end_pay_time	datetime			No		Deadline for payment
11	end_print_time	datetime			No		Deadline for printing the exam card
12	exam_time	char(200)	utf8mb4_unicode_ci		Yes	NULL	Written test time Text description
13	exam_location	char(100)	utf8mb4_unicode_ci		Yes	NULL	Written test location
14	apply_position	longtext	utf8mb4_unicode_ci		No		Application List
15	number_of_applicants	bigint		UNSIGNED	Yes	NULL	Maximum number of applicants, empty means no limit
16	apply_info_edit_day	tinyint		UNSIGNED	No	3	The default number of days to modify the registration information is 3 days
17	exam_room_capacity	tinyint		UNSIGNED	No		Number of persons in a single examination room
18	apply_fee	decimal(15,2)			No	0.00	Registration fee
19	need_explanatory_material	tinyint		UNSIGNED	No		Is the explanatory materials needed?
20	explanatory_material_template	char(200)	utf8mb4_unicode_ci		Yes	NULL	Description material template file
21	creator	int			No		Creator
22	editor	int			Yes	NULL	Modifier
23	status	tinyint		UNSIGNED	No	1	Status 1 Normal 0 Disabled

Figure 2: Exam information sheet

#	Name	Type	Sorting order	Attribute	Null	Default	Comments
1	id	bigint		UNSIGNED	No		ID
2	uuid	char(50)	utf8mb4_unicode_ci		No		UUID
3	key	char(10)	utf8mb4_unicode_ci		No		Secret key
4	nickname	char(30)	utf8mb4_unicode_ci		No		Nickname
5	avatar	char(200)	utf8mb4_unicode_ci		No		Profile photo
6	inch_photo	char(200)	utf8mb4_unicode_ci		Yes	NULL	Photo
7	name	char(30)	utf8mb4_unicode_ci		Yes	NULL	Name
8	identity_number	char(18)	utf8mb4_unicode_ci		Yes	NULL	ID number
9	password	char(200)	utf8mb4_unicode_ci		No		Password
10	phone	char(30)	utf8mb4_unicode_ci		No		Phone number
11	country_code	char(10)	utf8mb4_unicode_ci		No		Country code
12	register_ip	varchar(45)	utf8mb4_unicode_ci		No		Registered IP
13	last_login_ip	varchar(45)	utf8mb4_unicode_ci		No		Last login IP
14	last_login_time	datetime			No		Last login time

Figure 3: User information table

#	Name	Type	Sorting order	Attribute	Null	Default	Comments
1	id	bigint		UNSIGNED	No		ID
2	uuid	char(50)	utf8mb4_unicode_ci		No		UUID
3	user	char(50)	utf8mb4_unicode_ci		No		Attributed user
4	name	char(30)	utf8mb4_unicode_ci		Yes	NULL	Name
5	email	char(50)	utf8mb4_unicode_ci		Yes	NULL	Email
6	identity_number	char(18)	utf8mb4_unicode_ci		Yes	NULL	ID number
7	nation	char(20)	utf8mb4_unicode_ci		Yes	NULL	Ethnicity
8	political_status	char(20)	utf8mb4_unicode_ci		No		Political Status
9	married_or_not	tinyint		UNSIGNED	No	0	Marriage 0 Unmarried 1 Married
10	start_work_time	datetime			Yes	NULL	Start working time
11	foreign_language_level	char(30)	utf8mb4_unicode_ci		Yes	NULL	Familiar foreign language and level
12	computer_skill	char(10)	utf8mb4_unicode_ci		Yes	NULL	Computer proficiency
13	hometown	char(50)	utf8mb4_unicode_ci		Yes	NULL	Place of origin
14	current_address	char(200)	utf8mb4_unicode_ci		Yes	NULL	Current address
15	height	int			Yes	NULL	Height
16	employer_and_position	char(200)	utf8mb4_unicode_ci		Yes	NULL	Work unit and position
17	professional_qualification	char(100)	utf8mb4_unicode_ci		Yes	NULL	Qualification or professional qualification

Figure 4: Registration information form (partial)

3.2.4. Order Information Sheet

The order information form contains order information such as order ID, paid user, amount due, paid amount, payment method, and payment time. Figure 5 shows the registration information form.

#	Name	Type	Sorting order	Attribute	Null	Default	Comments
1	id	bigint		UNSIGNED	No		ID
2	uuid	char(50)	utf8mb4_unicode_ci		No		UUID
3	user	char(50)	utf8mb4_unicode_ci		No		Payment User
4	apply	char(50)	utf8mb4_unicode_ci		No		Administration Information
5	exam	char(50)	utf8mb4_unicode_ci		No		Exam
6	order_number	char(50)	utf8mb4_unicode_ci		No		Order number
7	due_amount	decimal(15,2)			No		Amount due
8	paid_amount	decimal(15,2)			No		Actual amount
9	refund_amount	decimal(15,2)			Yes	NULL	Refund amount
10	payment_method	char(10)	utf8mb4_unicode_ci		No		Payment method
11	payment_time	datetime			Yes	NULL	Payment Time
12	refund_time	datetime			Yes	NULL	Refund time
13	callback_data	longtext	utf8mb4_unicode_ci		Yes	NULL	Payment notification callback data
14	remark	char(200)	utf8mb4_unicode_ci		Yes		Remark
15	status	tinyint		UNSIGNED	No	0	Status 0 pending payment 1 payment success 2 payment failure 3 refund success 4 refund failure

Figure 5: Order Information Sheet

4. Specific Development and Implementation

The school personnel recruitment system uses B/S architecture, MySQL database, PHP language and other technologies, and responsive design of web pages to meet the actual needs of users on both the PC and mobile side. The following describes the system development and implementation process according to the user functions.

4.1. User Login

The system users are divided into administrator users and normal users, and the users will operate according to their respective rights after logging in. Figure 6 shows the administrator login interface, and Figure 7 shows the common user login interface.

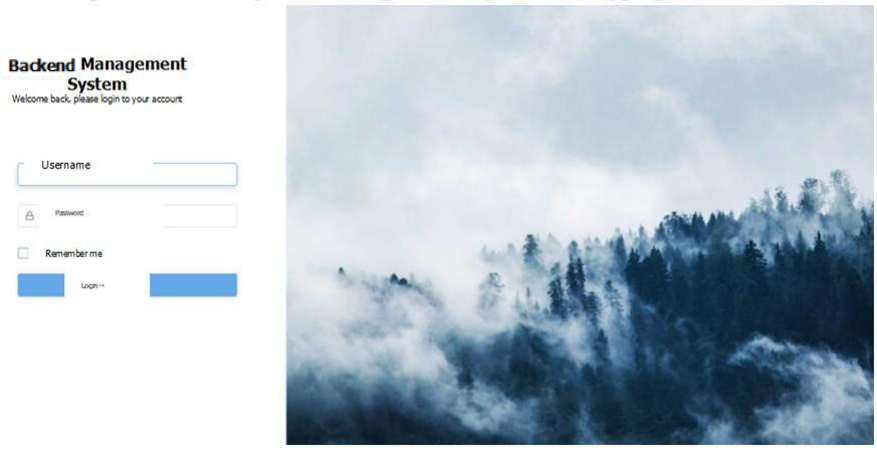

Figure 6: Administrator login screen

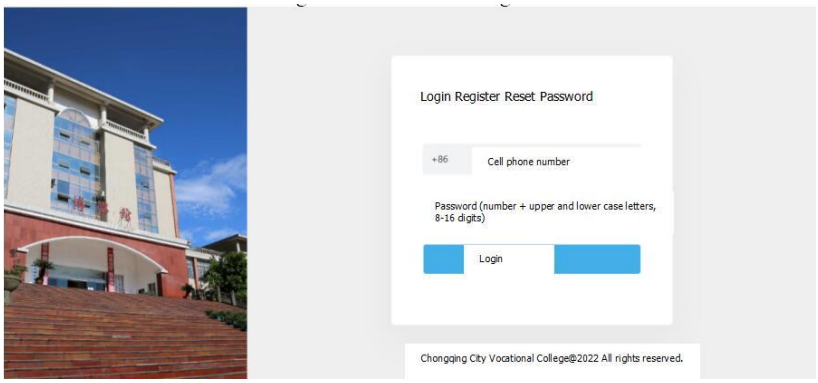

Figure 7: General user login screen

4.2. Administrator Users

After the administrator logs into the system, he/she can configure the system including: System logo, background image, SMS time, SMS template fixed settings, etc., publish formula announcement, review registration information, generate pass number, and send mass SMS. Figure 8 shows the administrator user interface.

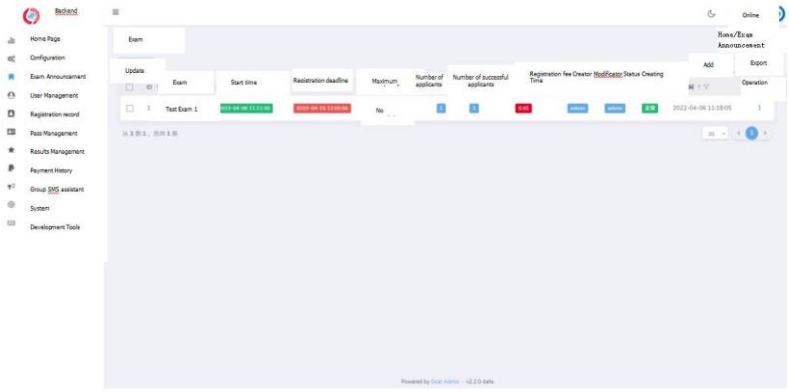

Figure 8: Administrator user interface diagram

4.3. General Users

Candidates can log in to the system through their registered accounts and passwords, or log in directly to the system through their cell phone numbers and SMS verification. After logging in, users can modify and improve personal information, view test announcements, fill in application information, make payment and print the pass, etc. Figure 9 shows the general user interface.

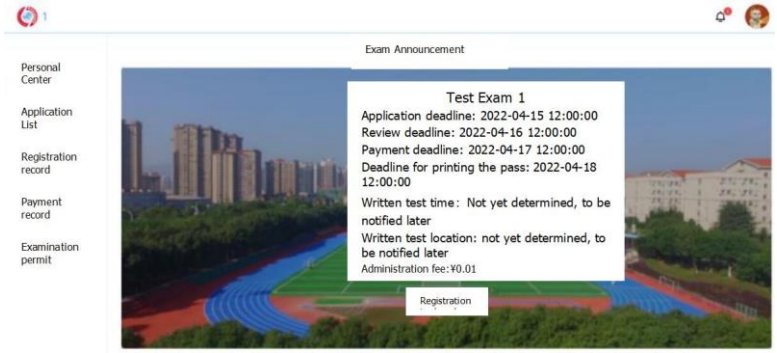

Figure 9: General user interface diagram

4.4. System Testing and Refinement

In order to improve the quality of the system development and timely find problems and modify it, the testing covered the whole development process. Testing was carried out on both PC and cell phones, mainly with white-box testing in the code writing stage and black-box testing in the functional testing stage. After the development was completed, the system was deployed to the school server, and the personnel of the Personnel Office organized online tests to find problems and make timely modifications. After several rounds of testing and continuous improvement, the system is running as expected.

5. Conclusion

In the background of such rapid development of information technology, the development of a school personnel recruitment system is an urgent need for school recruitment. The system adopts B/S architecture, based on PHP technology and MySQL database technology, with scientific and reasonable design and easy-to-use interface. Through the system, the personnel recruitment department has simplified the workflow and work content, improved work efficiency; saved paper and reduced the error rate; realized two-way communication between recruiters and applicants, and achieved the effect of timely communication of information. After the trial run, the school personnel recruitment system is well used, stable, easy to operate, and can better meet the needs of the recruitment work, effectively improving the level of information technology of the school recruitment work.

References

[1] Meng Fanbo. Information management system design and implementation based on college student management. Electronic technology and software engineering. 2021 (17): 169-170.
[2] Zhi Mingming. Teaching management system design of universities based on big data. Information and Computer (Theory Edition). 2021 (24): 150-152.
[3] Zhou Heping. The design of university personnel management system in the context of smart campus. Wireless Connected Technology. 2022 (01): 62-63.
[4] Ruan Xiaowei, Pu Mei. Design and analysis of personnel system in colleges and universities. Computer Knowledge and Technology, 2017 (08): 95-97.
[5] Dong Mengshu, Wen Jie. Research and practice on data security strategy of personnel recruitment system in higher education. Cyberspace Security, 2019 (10): 74-79.
[6] Huang Zhangwei. Design and research of personnel recruitment system for universities based on SOA and cloud computing. Information Technology and Informatization. 2015 (06): 36-38.
[7] Lu Chengsong. J2EE-based personnel recruitment system design and implementation for universities. Dalian: Dalian University of Technology, 2015.
[8] Yan Hao. Design and Implementation of personnel recruitment Management System for Universities Based on B/S Architecture. Jilin: Jilin University, 2016.
[9] Fan Shiyu. Design and Development of personnel recruitment System in Higher Education. Dalian: Dalian University of Technology, 2018.
[10] Song Dongxiang, Wang Yiran. An optimization scheme for university faculty recruitment management system. Electronic Production, 2022 (02): 41-44.