ΠΑΜΙΒΙΑ UΠIVERSITY
OF SCIEΠCE AΠD TECHΠOLOGY

Faculty of Computing and Informatics

DEPARTMENT OF INFORMATICS

QUALIFICATION : Bachelor of Informatics and Bachelor of IT in Business Computing	
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COURSE: Enterprise Web Application Development	**COURSE CODE:** EWD621S
DATE: January 2019	**SESSION:** 2
DURATION: 3 Hours	**MARKS:** 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION	
EXAMINER(S)	Mrs. Katazo Amunkete and Mr. Eliazer Mbaeva
MODERATOR:	Mr. Kandetu Tengovandu

THIS QUESTION PAPER CONSISTS OF 8 PAGES
(Including this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.
4. All marks are indicated in brackets at the end of each question.
5. The length of the answer/s must be guided by the available mark/s.

SECTION A: STRUCTURED QUESTIONS   [40 Marks]

Question 1
Explain what a direct SQL command injection is and discuss how it compromises security on a database.   [4 Marks]

Question 2
Discuss **any two (2)** challenges that can be encountered in the process of integrating two or more enterprise web applications.   [4 Marks]

Question 3
Explain how the client – server computing model works. Create a model to illustrate your knowledge.   [4 Marks]

Question 4
State any **three (3)** advantages of using open source technologies.   [3 Marks]

Question 5
Define what a data model is.   [2 Marks]

Question 6
Discuss the three (3) parts of a data model.   [6 Marks]

Question 7
Explain what is meant by PHP's superglobal arrays and mention one example.   [2 Marks]

Question 8
Distinguish between the GET and POST methods of form submission?   [4 Marks]

Question 9
Why is it necessary for an enterprise to be on the web?   [2 Marks]

Question 10
PHP is often a preferred language for developing web applications. Please discuss **three (3)** advantages that make it a preferred choice.   [6 Marks]

Question 11
How are Arrays perceived by PHP developers in comparison to Arrays in other programming languages?   [3 Marks]

SECTION B: PRACTICAL QUESTIONS [45 Marks]

Question 12

(a) Draw a physical data model with **3 entities, each with 3 attributes**. [8 Marks]
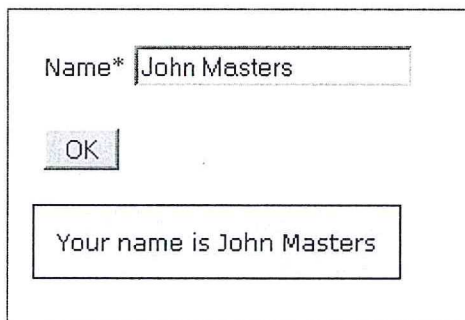
(b) Formulate a PHP script to create a connection to a database. Ensure that you provide a means of error control to determine whether the connection was successful or not. [5 Marks]

(c) Formulate **three (3) MySQL queries** to create three tables from the data model you drew in (a). Include a primary key field for each table. [12 Marks]

(d) Formulate **three (3) MySQL queries** to **insert sample data** into the three tables. [15 Marks]

Question 13

Write a script to create the form displayed in the figure below. When the submit button is clicked, the form should be processed within that same script and display the line as shown below the form. [5 Marks]

Name* John Masters

OK

Your name is John Masters

SECTION C: CASE STUDY [15 Marks]

Please read the case study below and answer the questions that come below it. Please write the responses in your own understanding. Copying directly from the case will result in a score of zero for that question.

Adapted from "Design and Implementation of Recruitment Management System" by Youyu Hu

1. Introduction

With the rapid development and popularization of the Internet and personal computers, more and more job seekers are inclined to online job-seeking, while many urban labor markets and most companies' human resources departments have also began to use online recruitment, and

each of them set up their own human resources databases. These bring out great changes in the traditional job management market. These changes also put forward new requirements for job recruitment, making it necessary to use network-based platforms for the advertisements of job recruitment. As a kind of open source software, PHP has many obvious advantages in the aspect of web application development, such as high security, being a cross-platform language, suppor for a wide range of databases, fast implementation, and many other advantages. Most current Internet platforms are based on a three- tier architecture development mode, namely in the program development and design, the system of the whole business application is divided into three layers: presentation layer, business logic layer and data access layer. Through layer development, functions in various levels become clear and all layers adapt strong independent phases, which is beneficial for development, maintenance, deployment and the expansion of a system. In this study, a system is realized that involves the establishment of recruitment requirements, examination and approval, information release, sorting, screening, hiring, and tracking according to the recruitment process of an enterprise. We attempt to set up a recruitment system that meets the personalized needs of internal recruitment, and the recruiting process used in an enterprise, thus automating the human resources business function. Moreover, the influence of the scope of recruitment information was expanded through large online intermediary platforms and school forums and information of recruiters were collected. Then we screened recruiters as well as arranged written examinations, interviews and admission work. After the recruitment, we tracked and analyzed the candidates, including the current job and work within half a year and one year of recruitment. Moreover, a talent analysis database was built to analyze these data, aiming to provide data references and recommendations for future recruitment.

2. The whole system module design

System design is an important stage in the information development process. In this phase, we will design the new system according to logic analysis results in the last stage and based on the requirement of a logic model. System architecture design is the design of specific physical models. The main goal of this phase is to change system logic programming that reflects the information needs of users into something that can be implemented by a computer-based physical scheme and provide the necessary technical information for the next phase of the system. This system uses the structured design method to realize the system's overall function which improve each phase of the system. The whole system is reasonably divided into function modules which correctly process the relationships between the modules and define the internal structure of each module. Figure 1 displays the overall function module structure of the system.
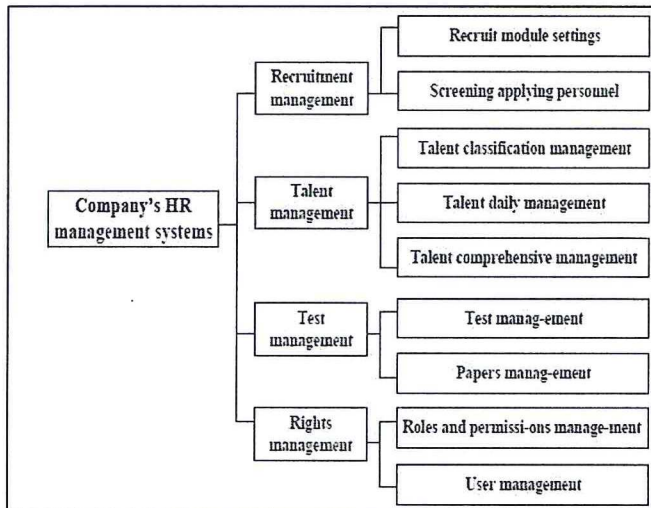
Figure 1: Overall function module structure of the system

3. System design and implementation in detail

Operating and managing a database composing of recruitment information is very important. It can be regarded as the foundation of a recruitment management system in an enterprise. Realization of the other functions is built on these bases. In this system, in order to create a connection to the database, we put the connection process in a separate header file (web. config), hence it is easy to share information between different databases. In addition, the ADO.NET technology applied in the system operates conveniently as only concise sentences are required. For example, in the Web config file, we only need to create a ConnectionStrings object, which is responsible for the connection to the system database. Only the following connection parameters are needed to complete the operation.

1. DSN: data source.

2. UID: user name to access the database.

3. PWD: UID and the corresponding password.

The system also uses the MYSQL database connection. When using this connection method, we should first add a data source named job in the MYSQL Control Panel of the system (the corresponding user name is "jj", password is "123456"). Afterwards, we can access the database through the three parameters.

The Code is as follows:

```
<%

set
conn=Server.CreateObject("ADODB.Connection")

conn.open "dsn=job;uid=jj;pwd=123"

%>
```

This system uses a secure way to authenticate users. Once a user accesses the application, a login

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box appears that prompts the user to enter their login credentials. The next step is for the user to fill in their user name and password and then click on the login button. An application management page will come up after the credentials are verified. If the login authentication failed, a corresponding error message will appear. Authorized users can access the recruitment management module which is divided into two levels, level 1 for classification and level 2 for template options. This data structure design is reasonable in data business operations and the front desk page display. Moreover, the display is clear and offers a good experience for users. The difficult point of this module lies in how to traverse template options which display based on a two-level classification. Here two circular list controls will be used. One is as a container displaying all level 1 categories in the system and the other one is applied to display the template item under that category. Circular list of level 1 category is traversed first. Then all items chosen by user under the circular list of the level 1 category are acquired and temporarily stored for usage. It continues until the last list of level 1 category is traversed. Here are the function key codes:

Key codes:

```
try
{ // Select list box, get the selected item ArrayList
list=new ArrayList()

for (int j=O;j<rptOption.Items.Count; j--)

{                              CheckBoxList
cklRight=(CheckBoxList)rptOption.Items[j]
.FindControl("cklOption"); cklRight.Enabled=true;

for (int x=0; x<cklRight.Items.Count; x--)

{

if (cklRight.Items[x].Selected=true)

{ list.Add(cklRight.Items [x]. Value); } } } }

catch (CMMException cmmex)

{ // Business exceptions, picture processing

SPUtils.CMMErrorTeardown(cmmex, lblError,
imgError); }

catch (Exception ex)

{ // System exceptions, common exception handling

SPUtils.ErrorTeardown(Session, Response, ex); }
```

The recruitment management module releases recruitment information and receives resumes from job-seekers. The first step of short-listing is to select out candidates who meet the requirements of the position and assess them with a written examination. Then a certain proportion of the candidates who participated in the written examination are selected for an interview. Finally, the candidate who is suitable for the position is confirmed. All the processes from application to the confirmation of the successful candidate happen on the recruitment

management module. Another module, the rights management module is divided into two main points: roles and permissions management; and user management. Roles and permissions management is considered to play a crucial role in ensuring the security of the whole system. The target system realizes the function by connecting right, role and user together. That means, right is not directly corresponding to user; a role is added between them. Role connects user and right. Right function can be implemented in this way. Moreover, the flexibility is large, which is beneficial for expansion of right demand afterwards. The roles and permissions module ensures that users are only able to access the parts of the system which are relevant to their job functions. User management refers to managing system operators. The maintenance of user information is simplified by the user management function. When adding or maintaining user information, we only need to select the role which is added in the system in advance.

3. Conclusion

This study analyzed the method used to develop a recruitment management system. A systematic structure approach was used in the design and development of the system. After the basic research work and design work were completed, we implemented and verified the system. Procedures of recruitment are verified in detail. Then various functions of the recruitment system are prospected. Recruitment as the main source of human resources in enterprise, directly affects the quality of employees and development potential. An excellent staff member will play an important role in the development of an enterprise. A good recruitment system will also play a good role in screening excellent candidates. At the same time a good set of personnel flow statistical analysis and a staff growth plan is also essential. Having a timely system that maintains information on the staff flow and understanding employee's demands can ensure the loyalty of staff to an enterprise. A human resources structure composing of a good recruitment system, an outstanding job evaluation system, sensitive staff flow analysis and a potential employee growth plan can ensure rapid and high-efficient development of an enterprise. Meanwhile, such a structure can also improve the competitiveness of an enterprise and enhance the development potential of the enterprise. Thus, a good recruitment and human resource management system can not only reduce recruitment costs and increase efficiency in the recruitment process but can also ensure a stable operation and the constant development of an enterprise.

---End of Case-study---

Question 14

(a) Differentiate between "roles and permissions management" and "user management".

[4 Marks]

(b) Briefly discuss the **three (3)** layers that make up an enterprise web application.   [6 Marks]

(c) Why is it a good idea to employ a layered approach to enterprise web application development?   [2 Marks]

(d) What factors necessitated the development of the recruitment management system?

[3 Marks]

---**End of Exam Paper**---