

# Design and Implementation of Customized Course Website of Data Structure

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**Abstract**—In this paper, ASP technology and Access Database are used to design and implement the general course website of Data Structure based on B/S mode. This website is developed through customized template. The column and style of the website can be implemented under the customized template. The user can publish various teaching resource through the service management. This development method separates the content design from the interface design. It will facilitate user to update and manage the website. The system has friendly interface and it is easy to be operated. The system is stable and has strong interaction. It supports many functions, such as information publication, dynamic interaction, upload and download. It is very important for promoting the course information exchange and enhancing teaching effectiveness.

**Keywords**— module; customized course website, template

## I. INTRODUCTION

In recent years, computer technology and network technology are developing rapidly and their applications in education are more and more widely. After class, students can learn the course through network by themselves and exchange learning information. It can help students to improve their learning interesting and learning effectiveness[1][2]. The data structure course as a required course in the major of computer science and technology, has a great important role in improving

students' abilities in analyzing problems, describing problems, and solving problems. In this paper, the teaching website of data structure course is set up. It can provide the relative course learning materials for students, such as PPT, the source codes, and supplementary materials. It can also provide the functions of homework release for teachers and the functions of homework submission for the registered students. The teaching BBS is built to support the conversation between teacher and students. It will be convenient for teacher to answer the student's questions. It also promotes the communication between the students. This system can promote the teaching efficiency and improve the teaching method.

## II. SYSTEM STRUCTURE

According to the features of teaching website and the course of Data Structure, the template-based teaching website is designed. This website not only supports the course of Data Structure, but also to support other courses through customized templates and modules. In this system, there are many kinds of templates and modules to implement the different functions for teacher[3][4][5]. Teacher can change the labels or layouts in order to change the appearance of the website. When the teacher publishes the various studying material on the website, the students can register and visit these material. The homepage of website is showed in Fig. 1.



Figure 1. The website homepage of Data Structure course

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The main function modules are discussed below:

(1) The course basic information module

There are several basic information modules in this system, including course introduction, course syllabus and curriculum, curriculum vitae of faculties who teach this course, assignments and examination papers, teaching videos, experimental teaching, teaching reform, and so on.

In the introduction of course module, there are basic items about this course, such as course syllabus, course curriculum, course textbook, teaching hours allocating, and so on. The course introduction will give students an overview about this course in order to help student have an initial understanding and clear learning target. The course syllabus provides the teaching plan and knowledge items in details. It will help students to study and review by themselves after school. The information in the course textbook provides the description of the main textbook and relative reference literatures. In the teaching hours allocation, the teaching hours which knowledge items need are distributed. The more important and more difficult the items are, the more time need. In the course syllabus and curriculum, the teaching date and experimental date, experimental classroom are discribed.

The module of instructional slides provides the power points for each chapter. Students can download these power points and review them.

In the module of faculties, the curriculum vitae of faculties who teach this course can be found. It can help students to learn backgrounds of those teachers and make a good choice on their elective courses

(2) The assignment module

The assignment module is an important factor. In this module, there are two functions, such as assignment management and online testing. The registered students can enter the assignment management system and modify their private information and password. It is showed in Fig. 2. When students log in the assignment management system, they can browse the assignments and submit their homework online in time. They can also view the submitted homework and marking-off homework. When the deadline of homework submission is passed, the submitted homework will be marked as delayed homework.

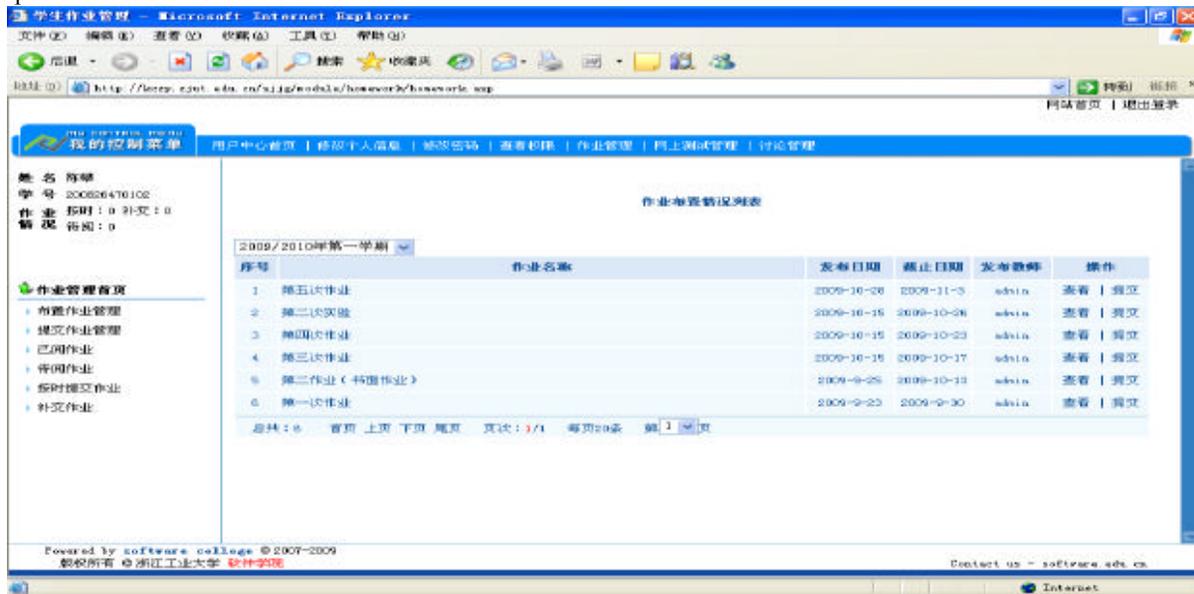


Figure 2. The assignment management system

(3) Upload/download module

In this module, declarations and implementations of data structures are published here. The relative source codes, solutions of homework and experiments can also be found here.

(4) Dynamical demo module

This module is designed to simulate the creation processes and applications of all kind of data structures through animated way. In the meantime, the source codes of creations and applications are showed in another window. Students can trace

the code step by step while the running result is showed in the animated way. This can help students to understand the data structure deeply. There are all kinds of sort algorithms in this module too. An example of eight queens problem is showed in Fig. 3.

(5) BBS module

In order to provide an in-time teaching support, BBS is set up. The registered students can discuss with other students or teacher about this course on this BBS. It is showed in Fig. 4.

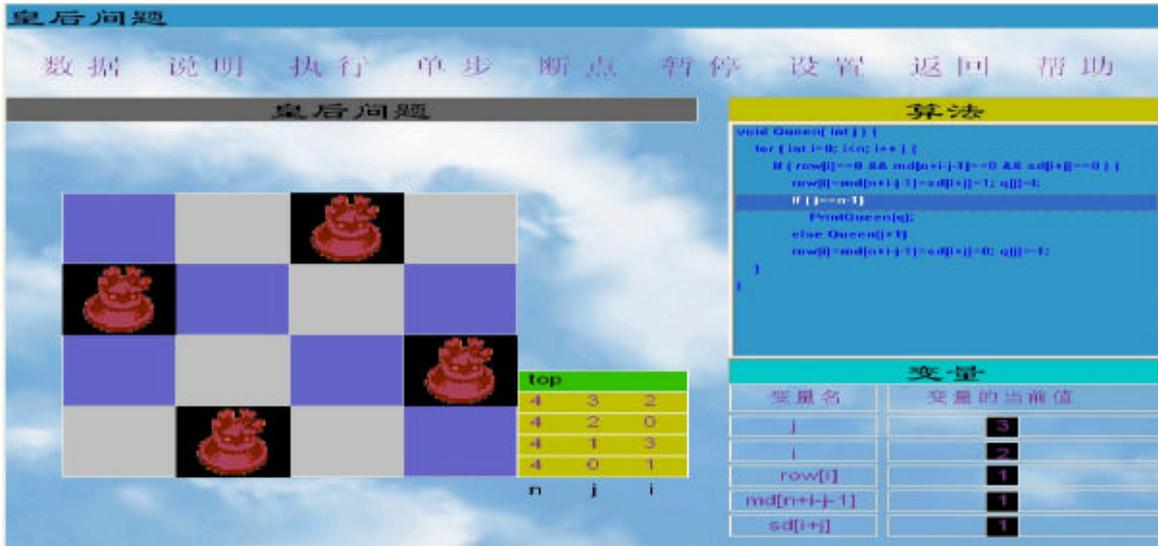


Figure 3. Dynamical demo system-eight queens problem

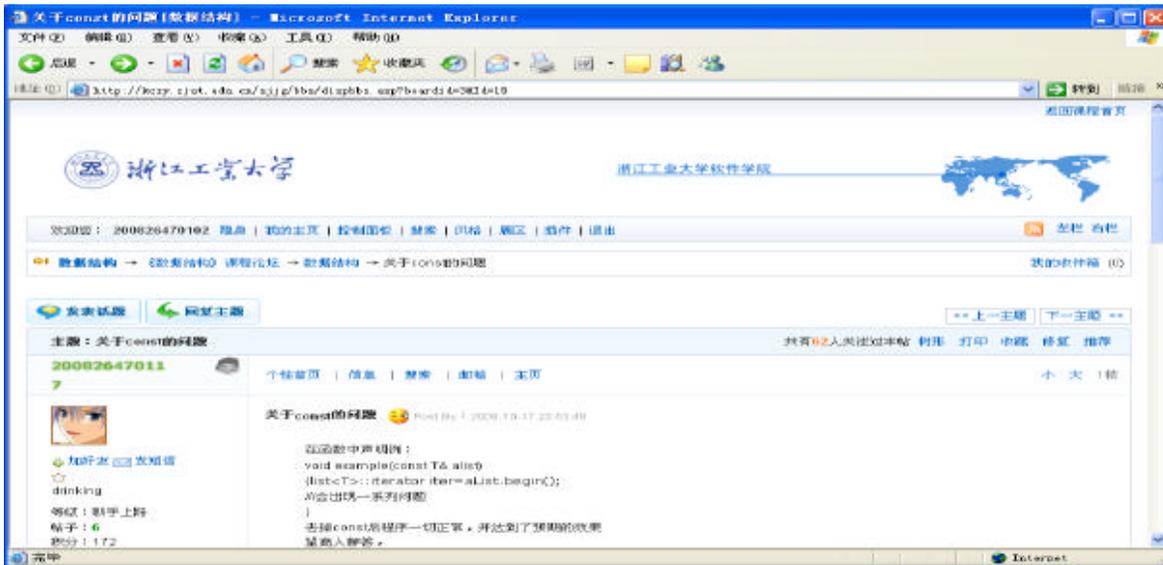


Figure 4. BBS in this course website

### III. MAIN FUNCTIONS

This website is designed based on B/S mode. In the client system these basic functions introduced above are provided. In the server system, the management system is set up. In this paper, the function modules are designed and implemented by templates and model. The main management functions are below:

(1) System configuration: There are three parts in this function, such as website information configuration, website function choice configuration, user choice configuration, and code of subjects and terms configuration.

(2) User management: There are two kinds of users. One is registered user and another is unregistered user. Different users have different permissions. Teacher can register as a super user and input the students' information through Excel files. The registered teacher can also login in and make an assignment and check the student's homework. The registered student can browse the assignment and submit his homework on this website. The unregistered user have no right to visit the assignment.

(3) Item management: There are multiple columns in this website. The manager can set up the different hierarchical items. The manager also can insert, delete, sort, reset, merge and configure these items. It is very convenient for website establish according to different requirements and different

goals. Based on this function, the customized website can be implemented more easily.

(4) Model management: The whole labels are divided into five basic models. They are text model, download model, picture model, model of curriculum vitae of faculties, and video model. These models almost cover the entire types of information resource and they can be used to construct different websites easily.

(5) Module management: This functions support to embed other application software in this website, such as friendship link, adv management, and testing system.

(6) Template management: There are different templates in this system. They are homepage template, general template, item template, user template, and single page template. These

different templates will make the website have different interfaces. The user can use the system label and user-defined label to customize the personalized website. The upload/download module is showed in Fig. 5.

(7) Right management: The system has a strong right management. The specified manager and detailed management rights can be updated. The whole website can be managed through different levels by different managers. There are super admin and ordinary user can set up different user group to manage different users.

(8) Website information management: This system provides online editor in order to support user to insert, delete, and update the content under different labels through relative attributes. This system also provides file management function. Any un-uploaded files can be deleted in time.



Figure 5. Upload and download module management

#### IV. CONCLUSIONS

The ASP and Access database are used to construct the Data Structure website in this paper. This website is designed and implemented through template, module and columns. It is very suitable for teacher to customize teaching website. It also promotes the diverse styles in teaching website. Teacher can

customize the labels and publish teaching resource in the server term. The teaching content representation and website design are separated. So teacher can easily update and manage the website. This website can be configured and used for different courses. Nowadays, many course have used this website platform to establish corresponding teaching website.

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