# Design and Implementation of Graduate Student Integrated Information Management System — Degree Management

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**Abstract:** Degree management is considered the kernel of the Degree Informationization Construction. With the continue population and development of information and technology, the government put great emphasis on college graduation student, effective and standard graduate student degree management system has been the mainstream direction of college graduation management system, as well as thenecessary means and effective ways to educate college graduation student. Firstly, this paper introduced the application status of graduate comprehensive information management system at home and abroad. Citing Anhui University of technology's graduation student education, we have analysised and researched the reality problems and emergency situations in the process of degree management, proposing reasonable solutions. Next, basing on Anhui University of Technology graduation degree management rules and degree management requirements, we designed graduation comprehensive information management system—degeree management software. The system has been devided five subsystem: thesis proposal management subsystem, mid-term examination subsystem, degree management subsystem,scientific information subsystem and fostering plan subsystem. Lastly, this paper not only introduced the test cases of the system but also summarized the system and put forward the prospect. This system is based on B/S(Browse/Server) and used OOD(Object-Oriented Design) method. In addition, software reuse and MVC(Model + View + Hibernate) pattern has been used in the paper. The degeree management software has improved the development efficiency greatly and reduced the development cost.Users can learn and master the software by its simple interactive inference.

**Key words:** Degree management, graduate management.

## 1. Introduction

With the improvement of national standards for graduate education in colleges and universities and the increase of attention to graduate education [1].

Education information management is the basic guarantee of graduate student management. Graduate degree management in various colleges and universities is slightly different in terms of construction ideas, campus culture and rules and regulations, so the graduate degree management system needs to be built according to the specific situation and actual needs of each university's own degree management. Graduate students are an indispensable and important part of graduate education. With the continuous promotion and development of the normalization construction of graduate students, the management and construction of leaders at all levels of graduate schools play an important role [2]. Meanwhile, the

management personnel play an important role in the degree management of graduate students in each school. Degree management not only plans the learning tasks and objectives of graduate students, but also directly relates to the successful graduation of graduate students and the awarding of master's degree certificates. The construction of graduate degree management system not only standardizes the training process of graduate students, but also helps to improve the work efficiency of management personnel and the enthusiasm of graduate students to learn, which plays an irreplaceable role in the long-term training and development of graduate education [3]. The Graduate School of Anhui University of Technology is based on the overall idea of the 13th Five-Year Plan for The Development of Academic Degrees and Graduate Education [4], [5]. It is generally believed that graduate education must have a brand new learning mode and perfect management norms, so the construction of a more comprehensive academic degree management system is an inevitable requirement for the development of graduate education. According to the actual situation of anhui University of Technology graduate school degree management and the specific requirements of each college degree management. Horizontally, degree management includes thesis opening report, mid-term assessment, pre-defense, thesis review and submission, thesis defense, degree application and training progress; Longitudinally, it includes the audit of graduate schools, the audit of graduate students and the application of graduate students of each school. Multi-angle and all-round management of postgraduate degree management not only ensures the learning tasks of postgraduate students, but also provides conditions for the comprehensive implementation of postgraduate education. Of course, it is also easy to detect the problems and shortcomings exposed in the process of graduate degree management, which provides a factual basis for the modification and improvement of graduate degree management methods of Anhui University of Technology. The operation of the degree management system not only strengthens the work efficiency of the graduate school of ANHUI University of Technology, but also facilitates the management of graduate degrees. It greatly strengthens the management methods of graduate degrees of Anhui University of Technology and meets the new requirements of the management of graduate degrees in the new era. In addition, the degree management system and the traditional degree management mode compared, whether in manpower or material resources, are fully demonstrated its (degree management system) superiority, full graduate integrated information management system design and implementation - degree management.

## 2. Postgraduate Integrated Management Information SYSTEM Design — Degree Management

### 2.1. Overall Structure

Graduate integrated management system - degree management consists of three layers, one is performance layer, the other is business layer, the third is the data layer, which are interconnected and interact with each other. The following Fig. 1. Overall structure.

### 2.2. Module Design

Degree management subsystem include preliminary defense module, preliminary reply audit module, the thesis reiterated please check module, the paper weight audit module, the paper submitted dissertation submitted audit module, application module, grading the registration module, the dissertation record module, the dissertation audit module[11], application module, the dissertation defense secretary management module, rejoin committee member management module, the defense Announcement module, degree application module, degree examination module. Pre-defense is a prerequisite for degree management. The following Fig. 2. Function module.
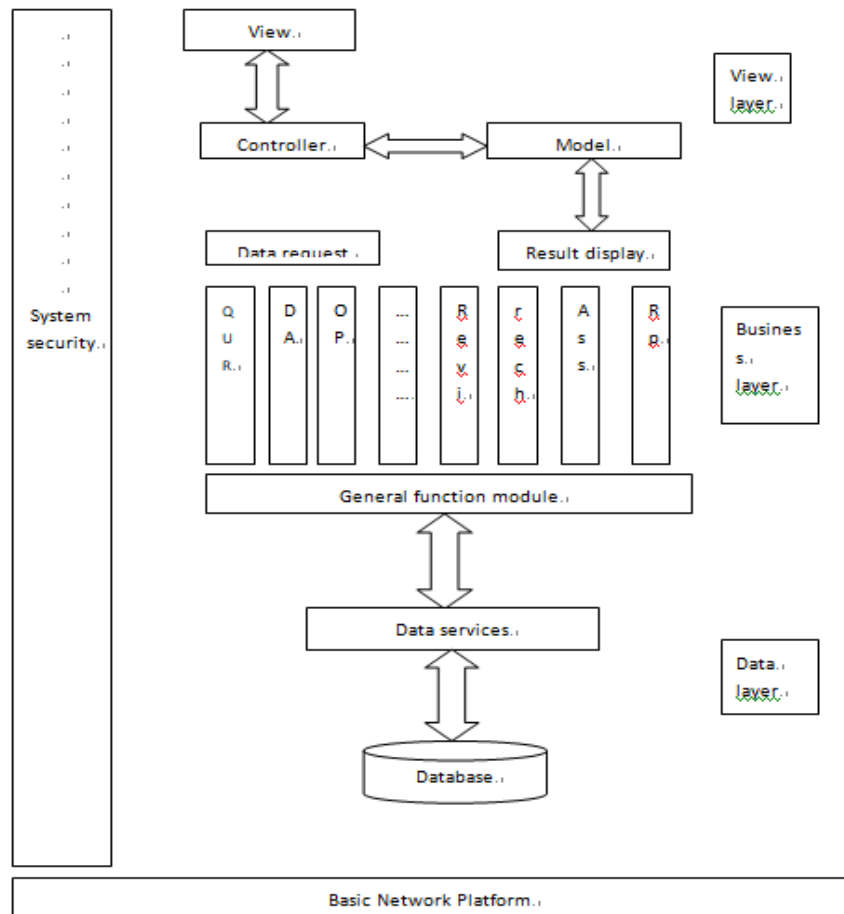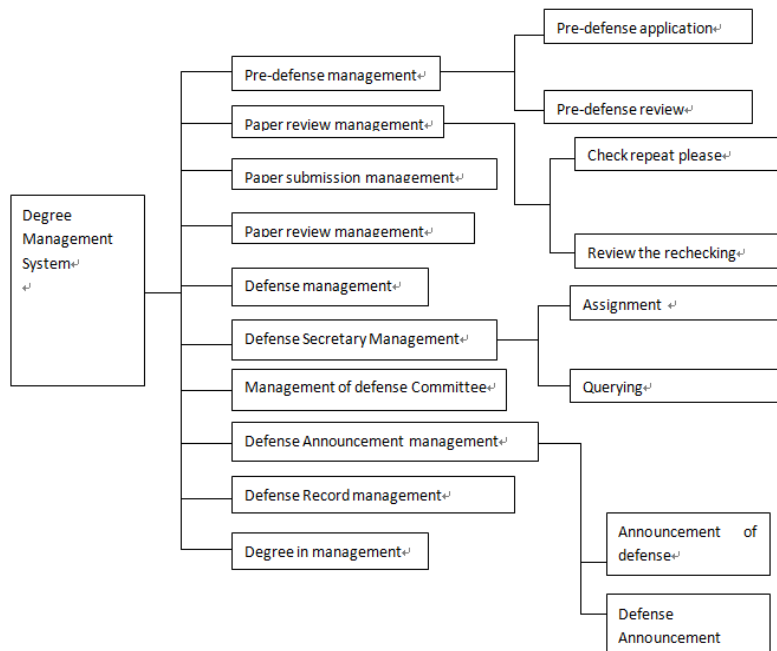
Fig. 1. Overall structure.



Fig. 2. Function module.

## 2.3. System Function

Degree management contains preliminary defense module, preliminary reply audit module, paper reiterated please check module, the paper weight audit module, the paper submitted dissertation submitted audit module, application module, comprehensive information management system for graduate students in grading the registration module, the paper, the design and implementation of degree management reply record registration module, the dissertation audit module, application module, the dissertation defense Secretary management module, answer committee member management module, defense announcement module, degree application module, degree examination module; Pre-defense records students in accordance with the requirements of pre-defense pre-defense fill in pre-defense related information; The pre-defense review records the relevant information of the review of the pre-defense application submitted by the teaching secretary of the college; Please record the students in the specified time to complete the graduation thesis writing, fill in the paper to repeat please, to achieve the school paper review, improve the quality of the paper; The paper review review records the review information of the teaching secretary and the student supervisor to the student paper review review request[13]; The paper submission application records the information of the paper external review application after the students pass the review; The paper submission review records the review information of the teaching secretary and the student supervisor on the student paper submission application; The paper review registration records the results of students' papers; The thesis defense application records the information that students submit the thesis defense application after passing the external examination; The examination of thesis defense records the examination information of the student's supervisor and the subject leader. Thesis defense record records the information of students' thesis defense; Defense secretary management records the subject responsible person to allocate defense secretary information to corresponding students; The defense committee member management records the defense secretary to the relevant students to allocate the defense committee member information; Defense announcement records defense secretary announced the relevant student defense information; Degree application records the information of students applying for degrees after passing thesis defense; Degree review records information about the degree review of students by the head of the discipline. The degree management functions are shown in Table 1, Table 2, Table 3, Table 4 and Table 5.

Table 1. Defense Secretary Management Records the Subject Responsible Person to Allocate Defense Secretary Information to Corresponding Students

| Pre-defense application | Pre-defense review | Please check your paper again | Review the paper |
|---|---|---|---|
| 1、According to the relevant requirements of the pre-defense application, fill in the relevant information<br>2、Pre-defense application editor<br>3、Pre-defense application for preservation<br>4、The pre-defense application is submitted | 1、Pre-defense review<br>2、Details of pre-defense<br>3、Withdrawal of pre-defense | 1、Students fill in the relevant information according to the requirements of the paper review request<br>2、Please edit the paper again<br>3、Please save the paper for review<br>4、Please submit your paper for review | 1、Review the paper<br>2、Paper review details |

Table 2. Submit Paper for Review, Paper Review Registration, Thesis Defense Record Registration

| Submit paper for review | Submit paper for review | Paper review registration | Thesis defense record registration |
|---|---|---|---|
| 1、Students fill in the relevant information according to the requirements of the paper submission application<br><br>2、Submit paper for review and apply for editor | 1、Submit paper for review<br><br>2、Details of paper submission<br><br>3、The paper is submitted for review and withdrawn | 1、Paper review registration added<br><br>2、The paper review registration is deleted<br><br>3、Review, register and edit papers<br><br>4、Review registration details | 1、Defense record registration added<br><br>2、Defense record registration modification |

Table 3. Application for Thesis Defense, Review of Thesis Defense, Defense Secretary Management, Management of Defense Committee

| Application for Thesis Defense | Review of thesis defense | Defense Secretary Management | Management of defense Committee |
|---|---|---|---|
| 1、Students fill in the information according to the requirements of the thesis defense application<br><br>2、Thesis defense application editor<br><br>3、Thesis defense application for preservation<br><br>4、Submit the application for thesis defense | 1、Review of thesis defense<br><br>2、Details of Thesis Defense<br><br>3、The thesis defense is withdrawn for review | 1、Defense Secretary Add<br><br>2、Defense Secretary Modification<br><br>3、Defense Secretary deleted<br><br>4、Details of Defence Secretary<br><br>5、Submitted by defense Secretary<br><br>6、The defense Secretary withdrew the submission | 1、Defense Committee added<br><br>2、Amendment of defense Committee<br><br>3、Deletion by defense Committee<br><br>4、Details of defence Committee<br><br>5、Submitted by the Defense Committee<br><br>6、The defense committee withdrew the submission |

Table 4. Defense Announcement Module, Degree Application Module, Degree Application Review

| Defense announcement | Degree application | Degree Application Review |
|---|---|---|
| 1、The defense secretary will make a public announcement about the members, time and place of the defense committee assigned by students | 1、Students fill in the information according to the degree application requirements<br><br>2、Degree Application Editor<br><br>3、Degree Application retention<br><br>4、Submission of Degree Application | 1、Degree Application Review<br><br>2、Degree application details<br><br>3、Degree application review withdrawn |

## 3. Graduate Student Integrated Management Information System Realizes — Degree Management

### 3.1. System Main Interface

User logs in to the system with a valid user name and password to enter the operation interface, as shown in Fig. 3.
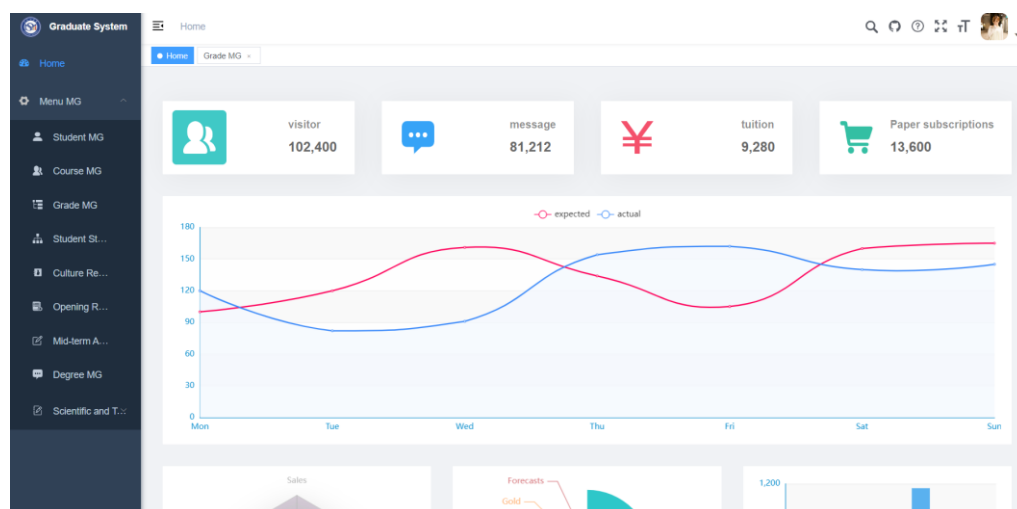


Fig. 3. Main interface.

## 3.2. Specific Functions

Degree management module realizes pre-defense application, pre-defense review, pre-defense application form printing, paper checking please reiterate, paper review review, paper review inquiry, paper submitted to review application management[9], paper submitted to review review, paper submit inquiry, paper review registration, paper defense application, paper defense audit, defense secretary, defense committee member meeting, defense announcement, defense registration, defense record inquiry and other seventeen management, as shown in Fig. 4-9.



Fig. 4. Management page of pre-defense application.



Fig. 5. Paper review please manage page.



| | Student ID | Name | Double-check results | Paper title | Type | Status | Create BY | Create Time | Level | Operate |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | 1 | 1 | 1 | Research on big data visualiz… | apply | In progress | admin | 2021-12-28 | | ⚲Update ☐Delete |
| ☐ | 2 | 2 | 2 | A study of mental health probl… | study | In progress | admin | 2021-12-28 | | ⚲Update ☐Delete |

Fig. 6. Paper review management page.
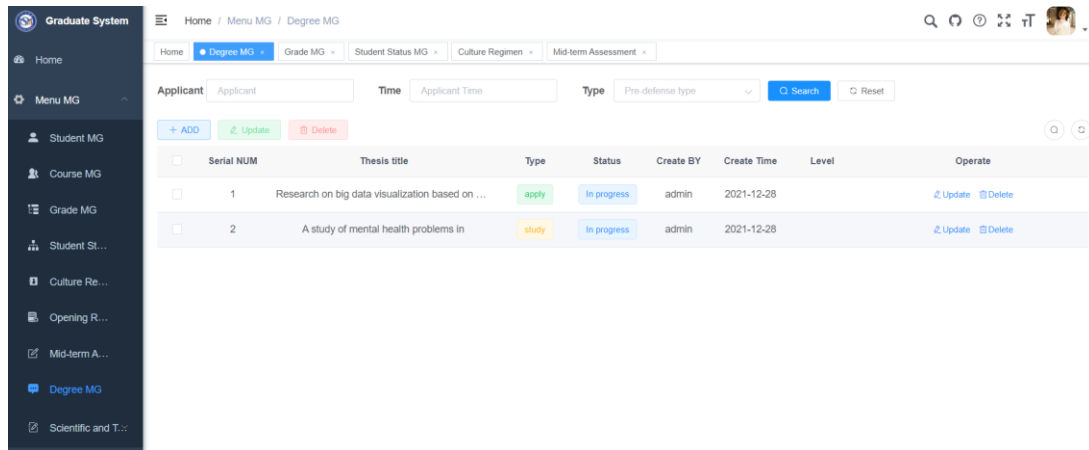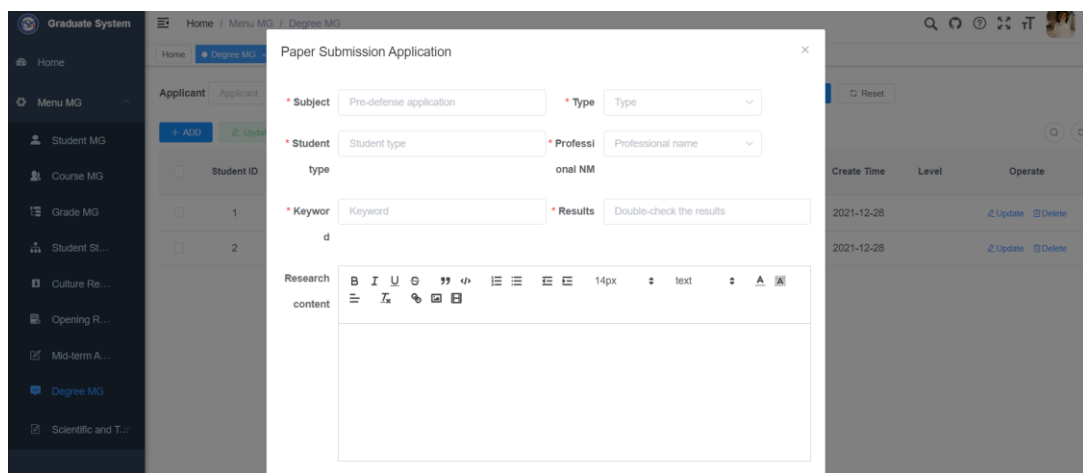
Fig. 7. Management page of paper requery.



Fig. 8. Management page of paper submission application.



Fig. 9. Paper submission management page.

## 4. Conclusion

With the continuous development and expansion of the regularization construction of graduate students, universities pay more and more attention to the management of graduate degrees. As an important part of postgraduate management, degree management has high management efficiency, clear management and responsibility compared with traditional management mode. So the development and use of a set of more perfect degree management system will give graduate degree management bring a new way of management.

Graduate student integrated information management system - degree management adopts B/S(Browser/Server) mode, adopts Object Oriented Design (Object Oriented Design), carries out four principles of security, reliability, practicability and ease of use. Meanwhile, Oracle database, SSH(Struts+Spring+Hibernate) framework and MVC(Model+View+Controller) structure are used. Graduate student integrated information management system: degree management includes five subsystems:

proposal report management subsystem, mid-term assessment management subsystem, degree management subsystem, scientific research information management subsystem and training progress management subsystem. Through the analysis and integration of the information of graduate thesis opening report, mid-term assessment, paper review, paper submission, paper review and registration, paper defense and so on, to provide reliable information basis for graduate graduation, employment, employment and so on. The main work completed in this paper is as follows:

1. I studied and analyzed the working mode of postgraduate degree management and how to improve the degree management system.

2. According to the actual situation of graduate degree management in Anhui University of Technology, the functional requirements of the system are analyzed in detail.

3. The degree management system of graduate School of Anhui University of Technology not only has a relatively perfect design for each subsystem and module, but also has a relatively comprehensive design for the system database.

4. The specific situation of each functional module of the system is introduced in detail and completely, and the system is tested by use cases.

The graduate degree management system of Anhui University of Technology is running stably and meets the requirements of graduate degree management.

## Conflict of Interest

The authors declare no conflict of interest.

## Author Contributions

Dong-Xu Liu and Dan-Dan Zuo conducted the research; Ying-Ming Wang analyzed the data; Xiu-Ru Li and Dong-Xu Liu completed the system implementation; Dong-Xu Liu wrote the paper; all authors had approved the final version.

## Acknowledgment

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