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Article

# Construction and Effectiveness Evaluation of an Artificial Intelligence-Assisted Student Affairs Processing Model for Counselors

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**Abstract:** This paper argues that the role of college counselors in the era of artificial intelligence is undergoing a profound transformation, and they not only need to have a solid theoretical foundation in education and practical experience, but also need to continuously improve their technological literacy and data analysis ability to adapt to the needs of the new era. At the same time, college counselors also need to actively innovate the student affairs processing mode, combined with the development trend and application prospects of AI technology, to explore a new path of student affairs processing with high efficiency and practicability. Specifically, big data, artificial intelligence and other technologies can be embedded in the student management system of colleges and universities, and design a set of intelligent transaction processing system for counselors to assist counselors to improve work efficiency. Finally, this project has designed and realized the intelligent transaction processing system, which has basically met the needs of college counselors to deal with student affairs. Through practical application, it is found that the system is effective in improving the work efficiency and quality of college counselors.

**Keywords:** artificial intelligence; management system; transaction processing; work efficiency

## 1. Introduction

Artificial intelligence technology, as a new force to enhance the productivity of the global society, has begun to play a reforming role in various industries. In the field of education, the application of big data question banks and cloud online learning platforms has made high-frequency, high-information, and high-communication-efficiency teaching and learning interactions the norm [1-3]. Colleges and universities are the base of higher education, and the application of AI, big data, cloud computing, 5G and other technologies in teaching, teaching affairs, and student management has an important role in promoting the teaching efficiency, teaching level, and student management order in colleges and universities [4-6]. Among them, when carrying out student affairs management, colleges and universities can apply artificial intelligence technology to all aspects of teaching management, academic affairs management and students' daily life management, and establish a long-term tracking and feedback mechanism with the help of artificial intelligence technology to actively improve the effectiveness of student affairs management, and promote the growth and success of students [7-9].

Colleges and universities in the development of student affairs management, to play the role of counselors and other management personnel, however, colleges and universities can not be reasonably divided into management responsibilities, resulting in greater pressure on management personnel, the work task is relatively heavy [10-12]. Although a variety of advanced technologies have long been infiltrated into people's daily life and production, universities still use traditional means and methods to



carry out student affairs management, resulting in low efficiency, bringing great pressure to the staff, and students can not get a comprehensive education [13-14].

At this stage, artificial intelligence technology has become the most well-known technology in the world, and gradually rewrite the shape of various industries, including the field of education. In the era of artificial intelligence, students and teachers can interact with each other through advanced functional educational products [15-16]. Universities are the cradle of cultivating talents and assume the function of scientific research, schools need to introduce artificial intelligence technology to realize the innovation of education and other work. In today's booming development of information technology, universities need to continue to innovate methods when carrying out student affairs management, seize the rare opportunity for development, and improve the effectiveness of the work. The combination of artificial intelligence and student affairs management can promote the innovation of affairs management [17-19].

This project firstly analyzes in depth the role transformation of college counselors at the level of work philosophy and methodology with the assistance of artificial intelligence (AI), and discusses the specific application of AI technology in student affairs processing. It mainly designs and implements an intelligent transaction processing system applicable to college counselors to strengthen student management and improve the efficiency and quality of counselors' office, so as to adapt to the requirements of all aspects of the school's development in the new period. For student affairs data, the system adopts the data processing method of Hadoop+Spark, integrates the secondary development of BIEE technology, combines the existing big data and artificial intelligence algorithms, and realizes the multi-dimensional and high-efficiency data analysis function.

## **2. AI-assisted intelligent student affairs model**

### *2.1. Role change of college counselors*

With the wide application of Artificial Intelligence (AI) technology in education, the traditional role of college counselors is facing a profound transformation [20]. In the context of this new era, college counselors must re-examine and adjust their roles to adapt to the rapid development of technology and changes in student needs. This transformation is not only a superficial adjustment of duties, but also involves a profound change in work philosophy and methodology.

#### (1) Transformation from traditional manager to wise guide

In the traditional education model, college counselors are mainly responsible for student discipline management, rule enforcement and other duties, playing the role of managers. However, in the age of AI, the personalization and precision of students' needs put forward higher requirements for counselors. Therefore, counselors need to transform into intelligent guides, using AI technology tools to provide students with more targeted and personalized guidance. This transformation requires counselors to not only have rich educational experience, but also master advanced information technology to better understand and meet students' needs.

#### (2) Transformation from one-way transmitter to interactive collaborator

In the traditional education model, counselors often play the role of one-way transmitter, while students are in a passive state of acceptance. This one-way education model has been difficult to adapt to the educational needs of the AI era. What students desire is equal communication, in-depth discussion and common exploration. Therefore, counselors need to transform into interactive collaborators and establish equal communication and discussion relationships with students.

#### (3) Transformation from information provider to information literacy cultivator

In the context of the big data era, information literacy has become one of the essential survival skills for students [21]. As an important node of information dissemination, college counselors not only need to provide students with necessary information resources, but also need to cultivate their information literacy. Therefore, in the AI era, counselors need to change from information providers to information literacy cultivators.

### *2.2. Specific Applications of AI in Student Affairs Processing*

With the increasing maturity of artificial intelligence technology, its application in the field of college student affairs management in colleges and universities has gradually shown a broad prospect. As an important implementer of student affairs in colleges and universities, college counselors should actively explore the specific ways of applying AI technology in student affairs processing in order to enhance the educational effect and meet the diversified needs of college students in the new era.

#### **2.2.1. Intelligent Transaction Processing System**

AI technology can be applied to university student affairs management systems to provide personalized learning support to students. Through the natural language processing capability of AI technology, intelligent transaction management systems can understand students' questions and provide accurate answers and explanations. This immediate feedback mechanism helps students find problems and solve them in time during the learning process, thus improving learning efficiency. At the same time, AI technology can also recommend personalized learning resources according to students' learning progress and ability level, and help students develop a reasonable learning plan. For example, for students who encounter difficulties in specialized courses, AI technology can generate targeted tutoring materials, provide problem-solving ideas and methods, and help students overcome learning obstacles.

### 2.2.2. Emotions and values education

The education of tutors for college students is not only the transmission of knowledge, but more importantly, guiding students to form a correct worldview, outlook on life and values. AI technology can analyze students' text inputs to identify students' emotional tendencies and values, thus providing teachers with targeted educational advice. For example, when students show extreme views or emotions when discussing a hot social issue, AI technology can send a timely warning to teachers, prompting them to pay attention to students' thought dynamics and intervene. In addition, AI technology can also simulate different roles and situations, allowing students to experience different emotions and values in their interactions with virtual characters, thus deepening their understanding and recognition of knowledge.

### 2.2.3. Assessment and feedback mechanisms

Traditional education assessment often relies on final exams or subjective evaluations, which are difficult to fully reflect students' learning and ideological dynamics. AI technology can provide more objective and comprehensive assessment results by analyzing students' learning data and behavioral performance. At the same time, AI technology can also provide students with personalized feedback and suggestions based on the assessment results, guiding students to clarify their learning direction and goals.

Due to the wide application of AI technology in student affairs management, in the later study this paper mainly applies AI technology to intelligent affairs management system to build an intelligent student affairs processing model. However, although AI technology has a wide application prospect in college education, some problems need to be paid attention to in the actual application process. For example, data privacy protection is an issue that cannot be ignored. When collecting and using student data, relevant laws and regulations and ethical norms must be strictly observed to ensure the privacy and security of students. In addition, the application of AI technology needs to be combined with traditional teaching methods and cannot completely replace the role of teachers. Counselors should choose AI technology reasonably according to the actual situation and needs of students in order to realize the organic integration of technology and education.

## 3. Intelligent transaction processing system design

Intelligent transaction processing system is very important for counselors, a good management system can simplify the work pressure of counselors and assist them to improve their efficiency. To ensure the normal operation of the system, are designed to meet the school's intelligent transaction processing system.

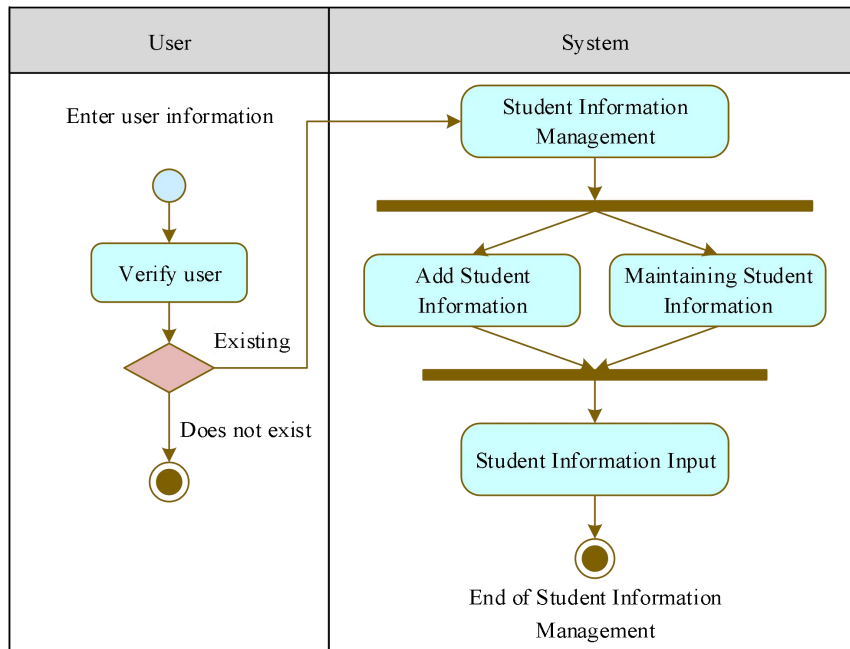
### 3.1. *Student affairs processing*

The functions of the Intelligent Transaction Processing System cover most of the aspects of student management in schools, in which counselors are mainly involved in the processing of basic information on students, student results and student disciplinary processing and other major daily tasks.

#### 3.1.1. Basic student information transactions

The business process of basic student information processing is shown in Figure 1. This module is mainly responsible for the management of the basic information of the students, is the basic data module of the system, all other modules must establish a relationship with this module. Of course, this module is also a bridge for other transfer of basic information. Counselors first need to initialize the basic information of the students, that is, before using the system, they must enter the basic information of the students. The counselor simply saves the data in an Excel file in the prescribed format and then

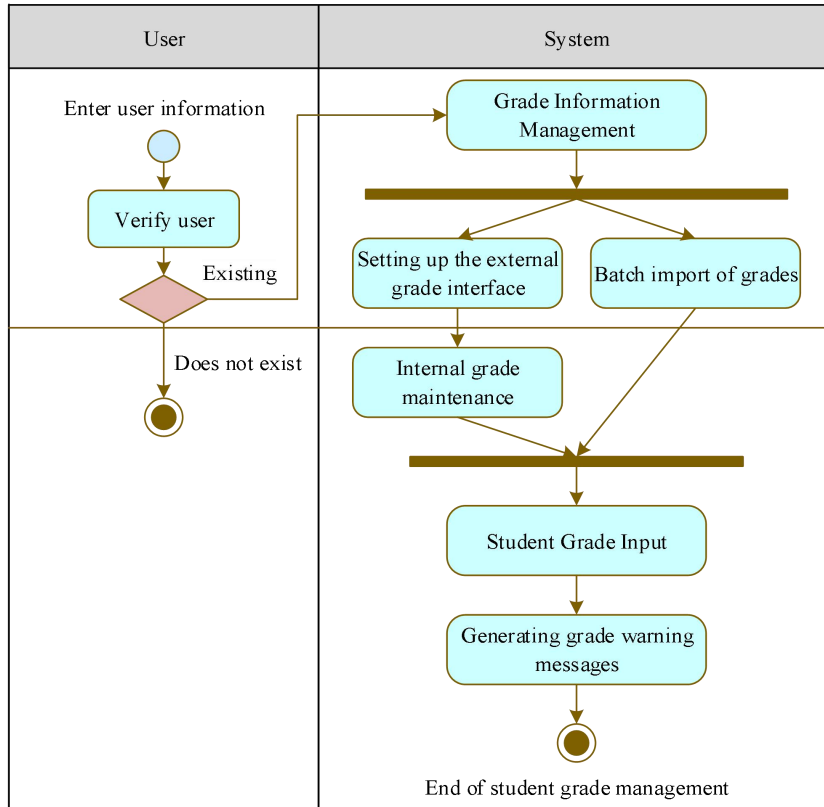
imports the Excel file into the system.



**Figure 1.** Business flow of student basic information processing

### 3.1.2. Student achievement transactions

The business process of students' grades processing is shown in Figure 2. Counselors need to count students' grades every semester, and analyze students' test scores by semester or according to a specified time period in stages. According to the research, most schools mainly complete the statistics of students' grades by semester, and finally make effective comprehensive evaluation of students' grades by academic year. At the same time, relevant warning levels are set for untimely grades.

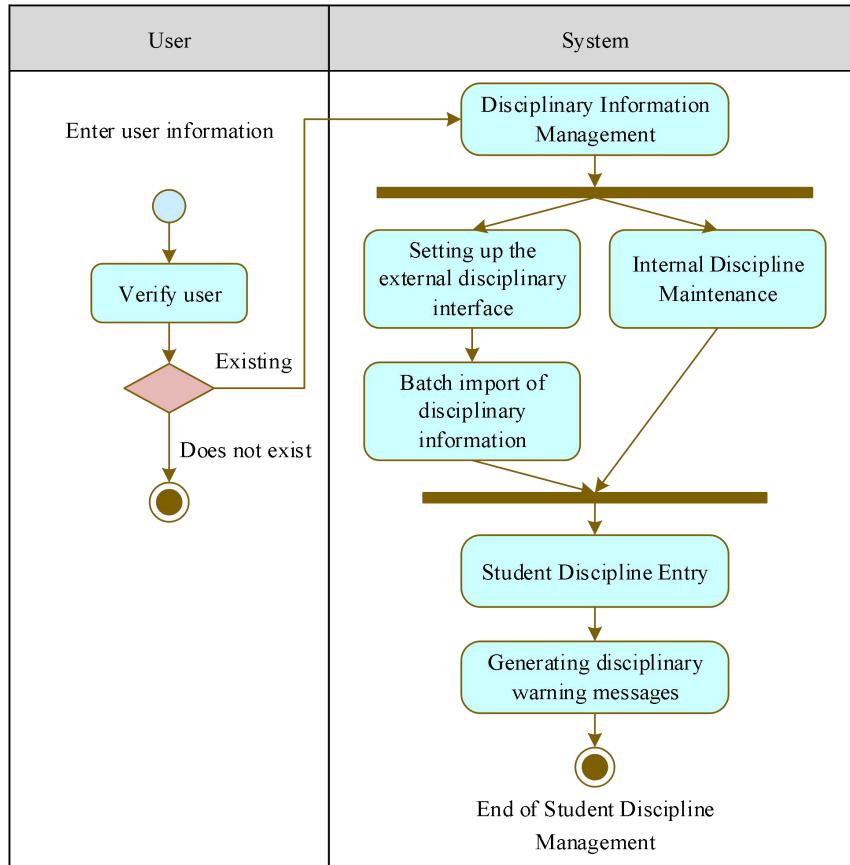


**Figure 2.** Business processes for student grade processing

If a student fails 3 courses in a semester or accumulates more than 5 failures in 1.5 years of schooling, the student's grade will be set to General Warning. If a student fails 3 major courses in a semester or accumulates 6 major course failures in 1.5 years of schooling, the student's grade will be set as a severe warning. If the student fails 3 courses per year or if the student fails more than 10 courses per semester, the student will be subject to a special treatment according to the university's documentation.

### 3.1.3. Handling of student disciplinary matters

The system stipulates that when a student violates the relevant system during his/her stay in school, the counselor can deal with the student's disciplinary action, but of course the system's disciplinary settings are more flexible. Mainly according to different students' disciplinary cases to deal with, the system can automatically categorize the disciplinary cases, which are handled according to the relevant rules and regulations formulated by the college. The student disciplinary process is shown in Figure 3.

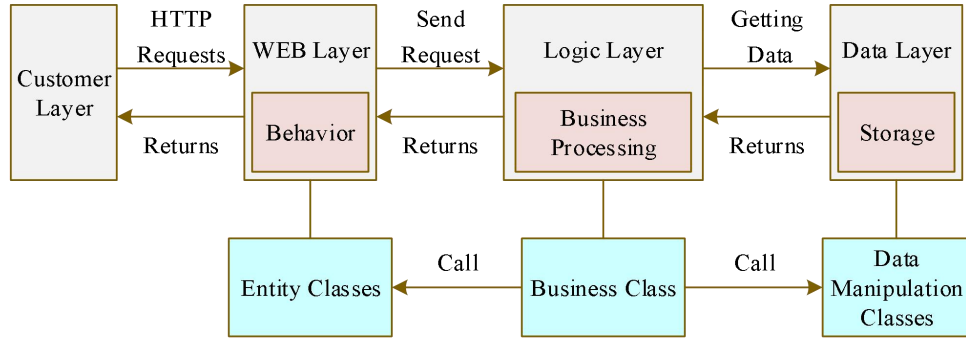


**Figure 3.** Student disciplinary business process

### 3.2. System architecture design

After the software requirement analysis is completed, the design of the intelligent transaction processing system can begin. The quality of the software design will directly determine the quality of the completion of the system, so it is necessary to strictly follow the needs of the system to carry out the overall planning of the software and the detailed design of the modules, to ensure that the design of the system is fully in line with the needs of the advance, to meet the requirements of users.

The intelligent transaction processing system adopts the three-layer architecture of Browser/Web/DataBase, with Browser providing a mode of browsing, Web providing service request and processing, and DataBase providing data storage. Users of the system can operate the system as long as the browser is provided in the client, and can add, modify, delete and query data management in real time. The specific software architecture design of the system is shown in Figure 4. In order to improve the stability and efficiency of the system, JSON format is used to operate the system data. Business logic classes and database operations, altogether providing the completion of business processing and data transfer, the traditional development is directly feedback data to the client's data operation controls, this operation has a great impact on the performance of the system. And here we submit the data format processing, and ultimately generate JSON format data provided to the client to JSON format submitted to the client can use rich client technology to achieve the receipt of data, greatly improving the performance of the system, and truly achieve the provision of services to the request and processing of high efficiency.



**Figure 4.** System software architecture diagram

The display layer is responsible for the dialog function between the user and the system, it is the window of man-machine dialog, the interface that directly interacts with the user, and provides the user with the interface that displays the data information or input and output. When changing the user interface, it only needs to rewrite the displayed controls and data checking without affecting the processing logic of the other two layers.

The service layer is the functional layer of data interaction, is a top-down interface, mainly to realize the business rules formulated with the business requirements, through this interface can transfer the user's input and output information to the data layer, after the data layer's request and response, return to the business logic layer.

The data layer is mainly responsible for reading, writing, updating, deleting and adding functions to the database data, and performs physical processing of data, which needs to deal with a large number of SQL statements.

## 4. Assessment of the effectiveness of the application of the smart transaction processing model

### 4.1. Detailed system design and implementation

This paper is based on the methodology proposed in Chapter 3 to design and develop an intelligent transaction processing system. The system chooses J2EE-based web development framework, uses Spark+Shark for integration development, and the frontend is realized by BIEE technology. Firstly, the specific implementation of the system architecture is introduced, and then the detailed design and implementation of the student basic information transaction processing module, student achievement transaction processing and student disciplinary transaction processing model are introduced respectively.

#### 4.1.1. System development environment

The version of the operating system used for the development and operation environment of this system is Microsoft Windows 10 Ultimate SP1 Edition, and MyEclipse 9.5 is used as the development platform for the coding and debugging of the system. Because the intelligent transaction processing system needs to deal with a relatively large amount of data, in order to ensure the normal operation of the system, through a comparative analysis, the use of Hadoop + Spark cluster approach, and the selection of data warehouse Shark as well as the selection of the Oracle database to store the final processed data. The system runs under the Tomcat server, and Tomcat 5.0 and JDK1.7.0\_15 are selected respectively.

The cluster environment of this system has a total of 3 PC machines, and the Hadoop and Spark cluster configurations are shown in Table 1 and Table 2, respectively. The Hadoop version is 2.1.0 and Spark version is 1.1. The maximum number of map tasks that can be run simultaneously in Hadoop is 8, the maximum number of reduce tasks is 2 (Data1 and Data2), and each task occupies up to 8GB of memory. In Spark, each node has 16G of computational memory (SPARK\_MEM = 16G).

**Table 1.** Hadoop cluster configuration

<b>Datanodes available: 2(2 total,0 dead)</b>	
Live datanodes:	
Name: 193.165.0.121:32072 (Data 1)	Name: 193.165.0.121:32073 (Data 2)
Hostname: Data1	Hostname: Data2
Decommission Status: Nomal	Decommission Status: Nomal
Configured Capacity: 43007535065(42.5 GB)	Configured Capacity:43007535062(42.5 GB)
DFS Used: 6218340007 (6.72 GB)	DFS Used: 6218340006 (6.52 GB)
Non DFS Used: 54932846728 (4.85GB)	Non DFS Used: 5435210127 (4.35GB)
DFS Remaining: 36722726636 (35.83 GB)	DFS Remaining: 36228060244 (32.18 GB)
DFS Used%: 19.26%	DFS Used%: 19.26%
DFS Remaining%: 71.72%	DFS Remaining%: 73.42%
Configured Cache Capacity: 0 (0 B)	Configured Cache Capacity: 0 (0 B)
Cache Used: 0 (0 B)	Cache Used: 0 (0 B)
Cache Remaining: 0 (0 B)	Cache Remaining: 0 (0 B)
Cache Used%:100.00%	Cache Used%:100.00%
Cache Remaining%: 100.00%	Cache Remaining%: 100.00%

**Table 2.** Spark Cluster configuration

<b>Id</b>	<b>Address</b>	<b>State</b>	<b>Cores</b>	<b>Memory</b>
worker-20241217085941-Slave1-40326	Slave1:40326	ALIVE	8(0 Used)	16.0 GB (0.0B Used)
worker-20241217100425-Slave2-40337	Slave2:40337	ALIVE	4(0 Used)	16.0 GB (0.0B Used)
worker-20241217143481-Master-40512	Master:40512	ALIVE	4(0 Used)	16.0 GB (0.0B Used)

#### 4.1.2. General realization of the system framework

From the system framework design in subsection 3.2, the framework structure of the intelligent transaction processing system is divided into display layer, service layer and data layer. The realization process of the system framework has three main steps:

First, the ODT tool is utilized in the batch processing layer to extract the required student transaction data.

Second, the data is processed in the service layer using the Spark engine and put into the Shark data warehouse. In this case, data mining, artificial intelligence and other techniques are used to process the data during the analysis of the student transaction model.

Finally, the secondary BIEE technology and jQuery technology are used to display the analysis results. All functional modules of this system are realized based on the above system framework.

The following is an example of the “student information search” function of the student basic information transaction module, and the specific implementation of each layer of the system framework structure is discussed in detail as shown in Figure 5.

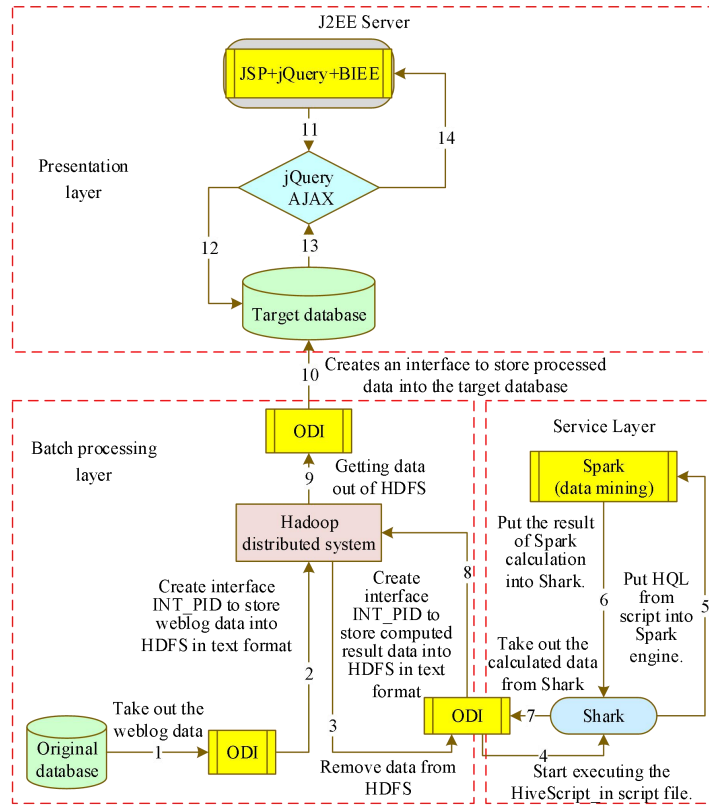


Figure 5. System workflow

#### 4.2. Related database design

In this paper, we design the Intelligent Transaction Processing System with the main purpose of assisting counselors to manage students more efficiently on a daily basis. The system involves student basic information data files, student achievement files, student disciplinary files, etc. Take the student basic information table as an example, the specific fields involved are shown in Table 3 (part). The table and the existing system of student registration management subsystem of the basic information table of students is basically the same, including student number, name, gender, political profile, ethnicity, place of origin, grade, major, class. Dormitory phone, ID card, date of birth, graduation school, parental units, contact phone, home address, contact phone, zip code, photo, graduation, changes in school registration, archives, notes and so on.

Table 3. Composition and design of the basic information table for students (portion)

Fields	Type	Character length	Instructions	Relevance
Student number	C	12	Student number, primary key	Basic code, associated with other tables
Name	C	10	Student name	-
Gender	C	2	Male or female	-
Professional code	C	10	Corresponding professional code table	Associated with professional code tables
Class situation	C	2	Corresponding class code	-
Graduation situation	B	4	Yes/No	-
Change of school status	C	2	Code	-
Nature of household registration	C	50	Rural or town	Related to student information base
Archiving status	B	2	Yes/No	-
Remark	C	200	-	-
...	...	...	...	...

### 4.3. Evaluation of application effectiveness

The Intelligent Transaction Processing System designed earlier in this paper to assist counselors in handling student affairs was applied to 137 counselors in X school for trial. Through the questionnaire in the form of a questionnaire to the counselors, the questionnaire recovery rate of 100%. The tutor questionnaire data were analyzed to assess the actual effect of the intelligent student affairs processing mode assisted by AI.

(1) Before the application of the intelligent transaction processing system, the main problems of the counselors' current handling of student affairs, as well as their work status, were first investigated.

The subjective feelings of counselors in dealing with student affairs work were investigated (10 items, multiple choice) and the results are shown in Table 4. From the perspective of the frequency of choice questions faced by the main problems, the biggest problems faced by counselors when dealing with student affairs were "blurred boundaries and unclear responsibilities of counselors (80.29%)", "stuck in transactional work and lack of thinking about professional development (80.29%)", and "too fast work pace and too much workload (55.47%)". It reflects that the work of counselors is complex and diverse, and they need to invest a lot of time and energy in daily transactional work, while counselors themselves feel fast-paced and stressed, and have less summary reflection and refined thinking about their work.

**Table 4.** Main problems faced by counselors in their work (Before trial)

<b>The main problem of the counselor's work</b>	<b>N</b>	<b>%</b>
The pace of work is too fast, and the work pressure is too high	76	55.47
There is no good precipitation and accumulation of work	67	48.91
Tired of dealing with all kinds of student problems	20	14.60
The work boundaries of counselors are vague and their duties are unclear	114	83.21
Confusion about the future of personal development	51	37.23
Stuck in transactional work, lack of professional development thinking	110	80.29
Education and professional title promotion is difficult	46	33.58
The work lacks a good incentive system	48	35.04
The work assessment mechanism is unreasonable	24	17.52
Life is stressful and the economic burden is heavy	36	26.28

The results of the research on the work status of counselors in dealing with student affairs work (4 items, single choice) are shown in Table 5. From the working status, it seems that most of the counselors (43.07%) feel that they can basically cope with their work at present, and a small number of counselors feel that they are not able to cope with their work in dealing with student affairs (24.82%). At the same time, it can also be found that only 13.87% of the counselors who are comfortable with their work and 18.25% of the counselors who are on the verge of collapse, which indicates that the university is in urgent need of a new model of student affairs processing to assist counselors in dealing with student affairs, and to assist counselors in dealing with student affairs through artificial intelligence and other methods, so as to alleviate the work pressure of counselors.

**Table 5.** The work status of the counselor in handling student affairs (Before trial)

<b>Working condition</b>	<b>N</b>	<b>%</b>
Handy at work	19	13.87
Can handle it at work	59	43.07
Work is inadequate	34	24.82
On the verge of collapse	25	18.25

(2) The intelligent transaction processing system was applied to X university to assist 137 counselors in handling student affairs, and a survey was conducted on the main problems and the working status, with the questionnaire questions consistent with the pre-test, in order to test the actual effect of the intelligent student affairs processing mode with the assistance of AI. The results of the questionnaire survey are shown in Tables 6 and 7, and it can be seen that during the three-month trial period of the Intelligent Transaction Processing System, the problems faced when dealing with student affairs have been significantly improved. Among them, there are three main problems: "the boundaries of counselors are blurred and their responsibilities are not clear", "they are stuck in transactional work and lack of thinking about professional development", and "the work pace is too fast and the workload is too large". From 80.29%, 80.29% and 55.47% before the trial, it became 38.69%, 38.69% and 28.47% after the trial, and the improvement effect was obvious.

**Table 6.** Main problems faced by counselors in their work (After trial)

<b>The main problem of the counselor's work</b>	<b>N</b>	<b>%</b>
The pace of work is too fast, and the work pressure is too high	39	28.47
There is no good precipitation and accumulation of work	34	24.82
Tired of dealing with all kinds of student problems	15	10.95
The work boundaries of counselors are vague and their duties are unclear	53	38.69
Confusion about the future of personal development	24	17.52
Stuck in transactional work, lack of professional development thinking	53	38.69
Education and professional title promotion is difficult	29	21.17
The work lacks a good incentive system	29	21.17
The work assessment mechanism is unreasonable	21	15.33
Life is stressful and the economic burden is heavy	35	25.55

**Table 7.** The work status of the counselor in handling student affairs (After trial)

<b>Working condition</b>	<b>N</b>	<b>%</b>
Handy at work	47	34.31
Can handle it at work	74	54.01
Work is inadequate	16	11.68
On the verge of collapse	0	0.00

The working condition of counselors in handling student affairs work has likewise improved significantly. Among them, the counselors who were on the verge of collapse decreased from 18.25% to 0. The percentage of working well also increased from the original 13.87% to 34.31% after the trial. Thus, it shows that this paper constructs an artificial intelligence-based student affairs processing model, which has a significant effect in assisting counselors in handling student affairs work.

## 5. Conclusion

With the rise and popularization of AI technology, the role positioning and strategy adjustment of college counselors in dealing with student affairs work has become a common focus of attention in both academic and practical circles. After in-depth analysis, this paper reveals the potential of AI technology to revolutionize the mode of handling student affairs in colleges and universities. It also discusses in detail the AI technology, applied to the design of intelligent transaction processing system. However, it is worth noting that, although AI technology has demonstrated significant advantages in the field of education, its specific application in counselors' handling of student affairs is still in the primary stage, and further research and practice are needed to verify its effectiveness. In conclusion, the era of artificial intelligence provides new opportunities and challenges for the role change of college counselors in handling student affairs. Schools should face up to this change, actively respond to the challenges, seize the opportunities, and continue to innovate and improve the effectiveness of counselors' work. At the same time, we should also maintain a prudent attitude, recognizing that the application of AI technology in handling student affairs work still requires further research and practice. Looking ahead, with the continuous development and improvement of AI technology, the roles of college counselors in handling student affairs work will be more diversified and professionalized, and the content and methods of education will be more colorful, efficient and practical.

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