

**THEORETICAL BASIS OF CALCULATING MULTIFACTOR RATING INDICATORS
OF STUDENTS IN HIGHER EDUCATION**

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Abstract: This article develops an information system aimed at automating the process of calculating and monitoring multifactorial rating indicators of students in the higher education system. The study analyzes the principles of creating infological and datalogical models of the database, the logical relationships between tables, and the process of designing them based on the relational model. The database of the system was developed using MySQL and PhpMyAdmin software tools, and the relationships between faculty, direction, course, group, student, and rating indicators were identified. As a result, a software product with a user-friendly interface was created, through which the ability to calculate and monitor the overall rating based on the results of students' educational, scientific, and social activities was provided.

Keywords: higher education, multifactor ranking, database, information system, MySQL, automation, monitoring.

Introduction. Today, digitalization processes in the higher education system are an important factor in improving the quality of education, strengthening management efficiency, and ensuring transparency of assessment processes. Effective organization of the educational process, regular monitoring of students' educational, scientific, and social activities, and the formation of objective rating indicators based on them require the introduction of modern information technologies.

Traditionally, student performance has often been assessed solely on the basis of academic performance. However, today, students' performance is multifaceted, and it is necessary to assess their creative, social, scientific, and initiative aspects. Therefore, the introduction of a multi-factor rating system will serve to create a fair and comprehensive assessment mechanism in higher education.

A multi-factor rating system allows analyzing the overall performance of students based on various criteria, automatically calculating results, and monitoring them in real time. Such systems are based on database technologies and simplify the process of processing, storing, and analyzing large amounts of data.

In this study, an information system for calculating and monitoring multi-factor rating indicators in the higher education system was developed. The study included the design of infological and datalogical models of the database, the identification of their interconnections, and the creation of a database in the MySQL and PhpMyAdmin environments. The developed software product also allows for data entry, modification, analysis, and automatic calculation of the overall rating through a user interface.

As a result, the developed information system makes it possible to evaluate the academic, scientific, and social activities of students in higher education institutions in an integrated manner, monitor their development, and digitize the process of making management decisions.

Calculation and monitoring of multi-factor rating indicators in higher education information system information model

The database design process is directly related to how data is presented and how it is displayed. As databases and their management systems develop, especially as the volume of data increases and the requirements for processing speed and efficiency increase, issues such as storing data, displaying it in the requested form at the right time, and transferring it require new approaches. An infological model serves as an important basis for solving such problems, since it is important to correctly select data types, follow normalization criteria based on the theory of relational models when creating tables, as well as determine the connections and relationships between tables. The use of automated design tools such as MySQL PhpMyAdmin in this process leads to new approaches and effective solutions. [5]

At the initial stage of designing a database using MySQL PhpMyAdmin, it is necessary to pay special attention to the types of data fields and their allocated memory space, as these must be set correctly to avoid time-consuming and memory-consuming problems when the system processes large amounts of data. Above saying passed to the information based on , table , field and their types is determined . System in the content tables and their structure in the table 1-6 views illustrated is , each in the table information following in order quoted :

- first in the row – of the table name ;
- second in line – table of the fields names and each field for information type .

Table 1. System in the content faculty about information schedule

Faculty ID	Faculty name
Numerical	Textual (Textual)

Table 2. System in the content direction about information schedule

Route ID	Faculty ID	Direction name
Numerical	Numerical	Textual (Textual)

Table 3. System in the content course about information schedule

Course ID	Course name
Numerical	Textual (Textual)

Table 4. System in the content group about information schedule

Group ID	Route ID	Course ID	Group name
Numerical	Numerical	Numerical	Textual (Textual)

Table 5. System in the content student about information schedule

Table 6. System in the content rating about information schedule

Student ID	Study year	Study indicators	Creative activity	Social activity	General rating
Numerical	Numerical	Numerical	Numerical	Numerical	Numerical

Obviously, a database will be created based on the proposed data logical model. Based on this database, an information system will be developed, which will automate the process of calculating ratings and make it possible to carry out this process efficiently and quickly.

The effectiveness of database management is based on the interconnection of data. The data tables in the system are interconnected through 1:1 (one-to-one), 1:n (one-to-many), and n:1 (many-to-one) relationships. These relationships were tested using MySQL Workbench, and a database was developed for the multi-factor rating system. In the next step, using the capabilities of MySQL Workbench, the complete tables were exported and formed in a MySQL database.[4]

The following basic system queries were developed on the data in the MySQL database tables:

- student about general information input ;
- student course , group , direction and faculty in the section to determine ;
- include indicators of the student's academic performance, creative achievements, and social activities;
- included information based on general rating to determine ;
- student's past training for years related rating the results save to put ;
- student's general rating fish according to sorting ;

It should be noted that these surveys will allow for automated management and monitoring of student ratings.

Development of an information system for calculating and monitoring multifactor rating indicators in higher education

A software package was developed based on the above research methods, mechanisms, and algorithms.

Production issued software of the tool functional scheme as follows is formed .

Student ID	Group ID	Student FISH
Numerical	Numerical	Textual (Textual)

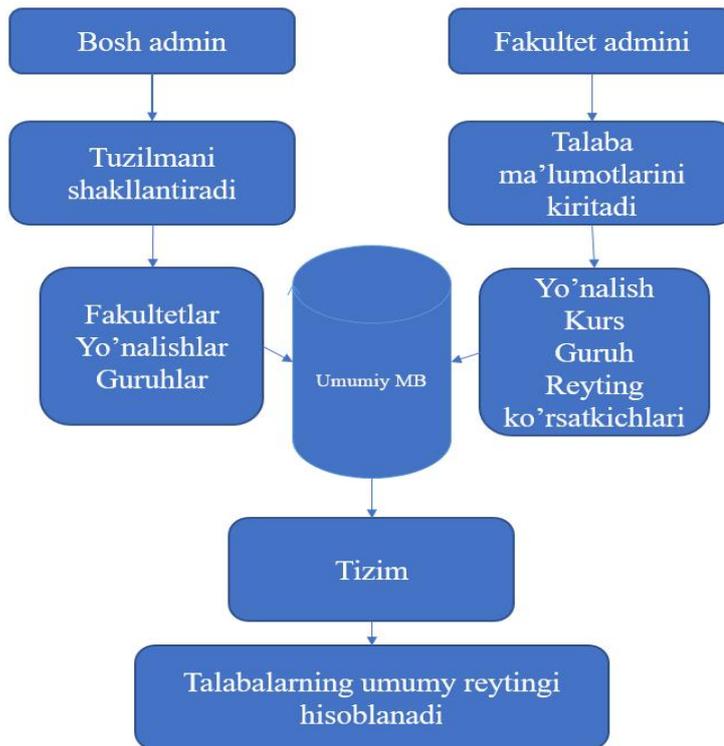


Figure 1. Software of the tool functional scheme .

To use the program, each user must register in the system. During the registration process, the type of user, as well as the username (login) and password required to access the program, are recorded. When the user logs in with their login and password, the information related to them is displayed in the system.

System following structural from parts organization finds :

- 1) To the system entrance
- 2) Faculties , areas , groups
- 3) Student information
- 4) Direction
- 5) Course
- 6) Group
- 7) Rating indicators
- 8) Students general rating

To the system entrance

The program is launched in a Web browser on a computer connected to the server on which the software is installed via a network. The network address of the software is entered into the browser's address bar. To log in to the system, a special page opens for the user, where it is required to enter a username (login) and password. If the username and password are correct and authorization is successful, the system is logged in.

Kirish

Login

Parol

Meni eslab qolish

[Parolingizni unutdingizmi?](#)

Figure 2. User authorization window

After the username and password pass the authorization check, login is performed.

Fakultetlar

[Uy](#) / Fakultetlar

Fakultetlar

Show entries Search:

ID	Fakultet nomi	Amallar
1	Intellektual tizimlar va kompyuter texnologiyalari	<input type="button" value="Tahrirlash"/> <input type="button" value="O'chirish"/>

Showing 1 to 1 of 1 entries Previous Next

Qo'shish

Fakultet nomi

Figure 3. Faculty Management Window

"Faculty Management Window" is a special interface designed to manage and control all information related to faculties in the system. Such a window can usually contain the name of the faculty, a brief description, educational programs or departments belonging to the faculty, information about the staff or professors working at the faculty. Using this window, the administrator or managers in the system can perform all operations related to faculties, add new faculties or update information about existing faculties. The interface usually has convenient navigation, filters and search functions, which help users find the necessary faculty quickly and easily.

Faculty from the chosen one then directions management opportunity appearance will be and as follows mirror harvest will be :

Yo'nalishlar

[Uy](#) / Yo'nalishlar

Yo'nalishlar

Show entries Search:

ID	Fakultet nomi	Yo'nalish nomi	Amallar
1	Intellektual tizimlar va kompyuter texnologiyalari	Dasturiy injiniring	<input type="button" value="Tahrirlash"/> <input type="button" value="O'chirish"/>

Showing 1 to 1 of 1 entries Previous Next

Qo'shish

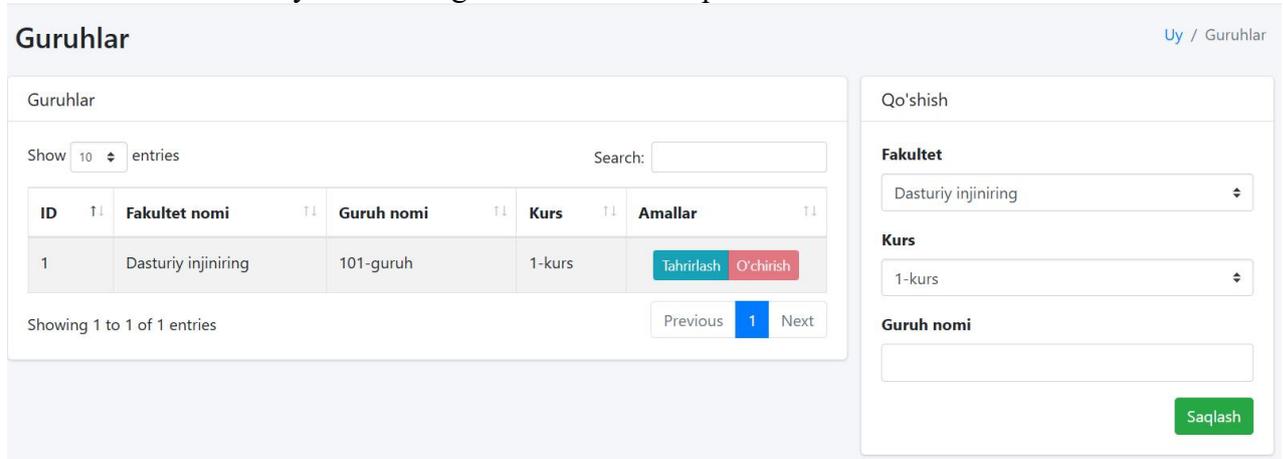
Fakultet

Intellektual tizimlar va kompyuter texnologiyala

Yo'nalish nomi

Figure 4. Directions management window

The data in the database is not provided with viewing rights to all users, only the right to edit (add, change, delete) data is granted only to users of the "administrator" type of the system. The admin module allows you to manage all modules and provides control over all sections.



Guruhlar Uy / Guruhlar

Guruhlar

Show entries Search:

ID	Fakultet nomi	Guruh nomi	Kurs	Amallar
1	Dasturiy injiniring	101-guruh	1-kurs	Tahrirlash O'chirish

Showing 1 to 1 of 1 entries Previous **1** Next

Qo'shish

Fakultet

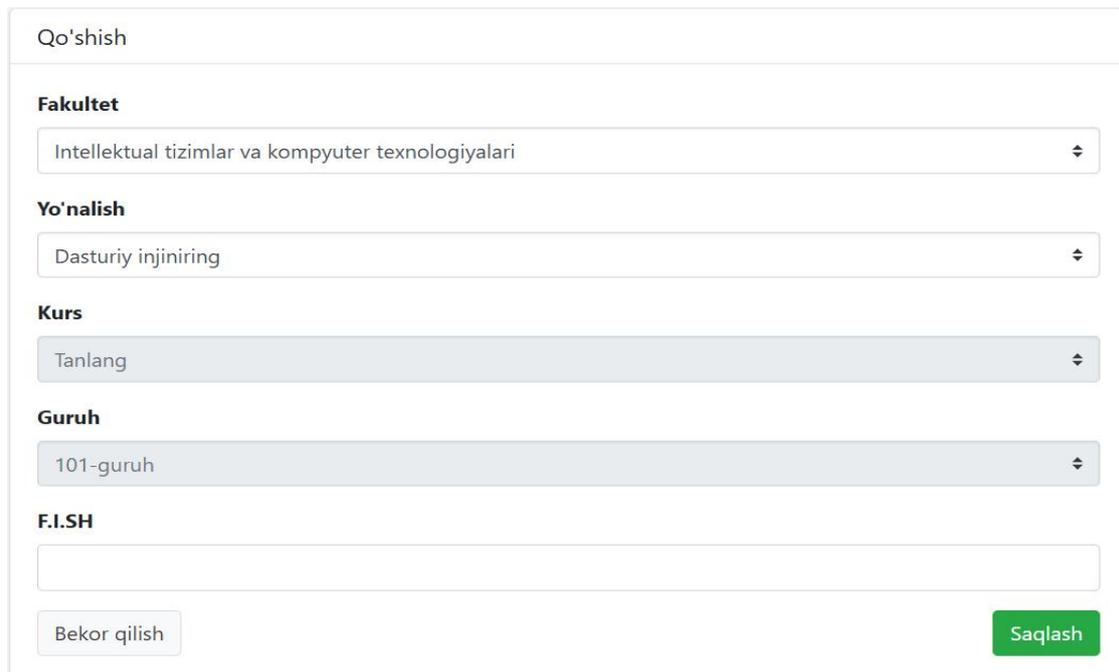
Kurs

Guruh nomi

Saqlash

Figure 5. Groups management window

Groups management window often users for intuitive and comfortable to the interface has are , groups with related all operations easy and fast done increase provides . In this window of the system administrators or known one to rights has users groups effective in a way to manage possible .



Qo'shish

Fakultet

Yo'nalish

Kurs

Guruh

F.I.SH

Bekor qilish Saqlash

Figure 6. Student add window

"Add Student Window" is a special interface designed for registering new students in the system and entering their data. In this window, the administrator or a user with appropriate rights in the system can enter all the necessary information about new students.

The design of the student addition window usually allows users to enter data quickly and accurately. The system displays all the information required from the user and provides a lightweight and simple interface for filling in the required fields. In this way, administrators or

users with appropriate rights to the system can manage the student addition process correctly and efficiently.



ID	Fakultet nomi	Yo'nalish nomi	Guruh nomi	Kurs	F.I.SH	Amallar
1	Intellektual tizimlar va kompyuter texnologiyalari	Dasturiy injiniring	1-kurs	101-guruh	Aliyev Ali Aliyevich	Tahrirlash O'chirish

Figure 7. Student information see window

Student information see in the window to the student relevant was data, that is student's name, surname, major name, group name course and faculties clearly to take possible.

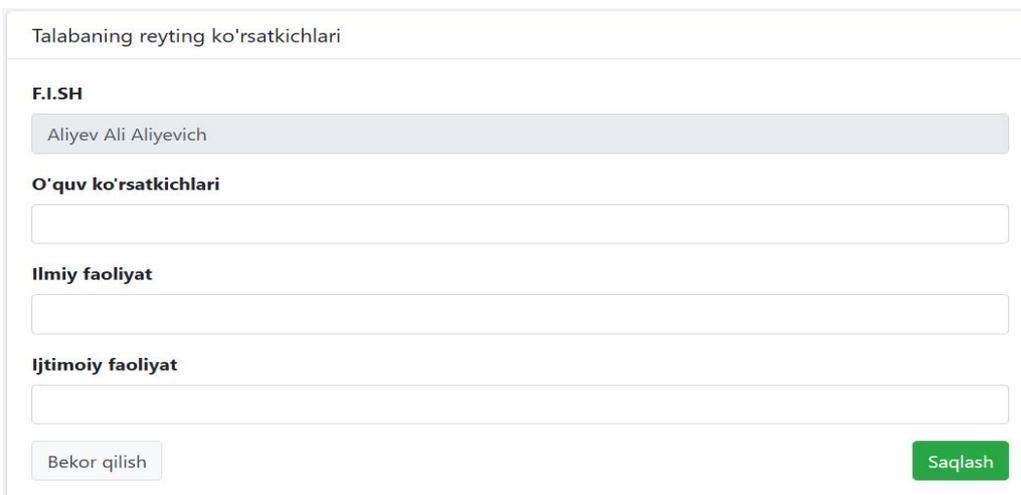
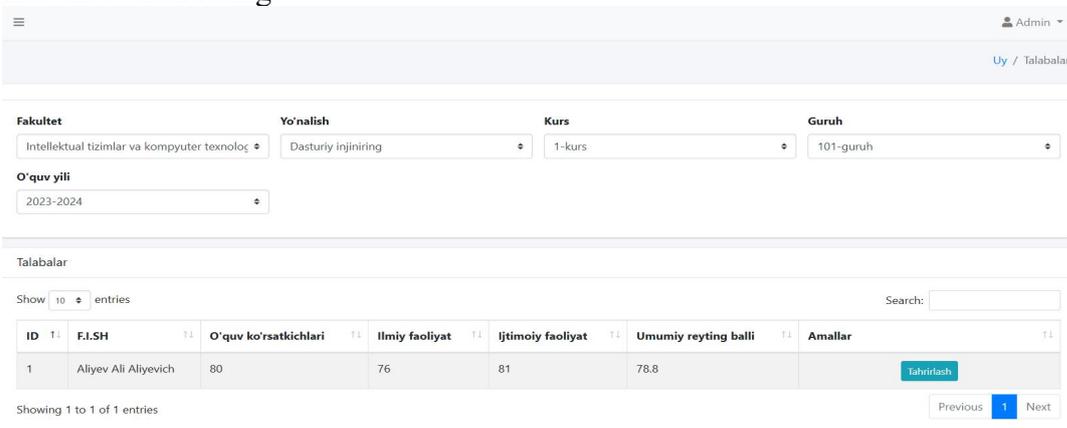


Figure 8. Student's rating indicators input box

After each of the student's academic performance, scientific and social activity results is entered, the overall rating is calculated. The window for entering student rating indicators is an interactive or automated system designed to systematically enter the student's academic performance, scientific and social activity results, and calculate the final overall rating. The purpose of this window is to evaluate the student's performance and convert his achievements into an overall rating.



ID	F.I.SH	O'quv ko'rsatkichlari	Ilmiy faoliyat	Ijtimoiy faoliyat	Umumiy reyting balli	Amallar
1	Aliyev Ali Aliyevich	80	76	81	78.8	Tahrirlash

Figure 9. Student's overall rating indicator

The student rating input window helps to form an overall rating by linking the student's academic performance, scientific and social activities. This system guides the student in assessing and developing his/her own performance, and also allows the educational institution to analyze students by individual and general indicators.

The creation of the ability to calculate and monitor multi-factor rating indicators based on the developed software product will serve to more effectively manage the higher education system and facilitate the assessment of students' academic achievements. By creating such a system, universities and other educational organizations will be able to evaluate students' academic, scientific and social activities in an integrated manner. As a result, the overall rating of students will be based on various factors and will be monitored clearly and transparently. An automated system for calculating and monitoring multi-factor rating indicators is an important tool for effective management of student activity in higher education institutions. This system helps to make educational processes at universities more efficient and transparent. It provides a fair and complete assessment for students, and allows for effective decision-making for the administration.

Conclusion. According to the results of the study, the developed information system allows for automated assessment of students' academic, scientific and social activities in higher education institutions based on a multi-factor rating. The system's data model quickly and efficiently implements the process of storing, processing and analyzing data. This approach reduces the influence of the human factor and increases the transparency and objectivity of the assessment process. The created system is of great importance in managing the quality of education, analyzing student achievements and digitizing decision-making processes, and can be used as an effective tool in the process of digital transformation of higher education institutions.

List of used literature

1. Uzbekistan Republic Presidential Decree No. PF-4947 of February 7 , 2017 Decree Tashkent, February 7, 2017, No. PF -4947 .
2. Nazarov FMDu'sanov RQSaydullayev Q. Methods of using digital technologies in managing the educational process and their effectiveness. UZA Ilm-fan (Electronic journal). - 2022. №(4). [365-372]. B
3. Akhatov A., Nazarov FM Method implementation of blockchain and basic cryptographic framework for system processing, data storage and electronic documentation. //Vestnik computer and information technology. International scientific journal, 2019. – #10. - S.3-13. Doi: 10.11489 /issn.1810-7206
4. Aminov I., Nazarov FM Use of modern electronic means and training of informatics of the 21st century International scientific journal.-2017. No. (2). Moscow. [69-73] p
5. Aminov I., Nazarov FM Use of interactive methods of education and teaching of informatics of the 21st century International scientific journal.-2018. No. (12). Moscow. [31-34] p.
6. DRMardonov, MAAkramjonova. Main indicators of the formation of student rating data in higher education. International scientific and practical conference on modern problems and solutions of nanophysics and photoenergetics in the development of information technologies and economic sectors-2023, [554-556]
7. Pardayev.M , Akramjonova.M . Employment rating point system mathematician models improvement.Intellectual generation with new Scientific and Practical Conference on Uzbekistan -2023,[260-264]
8. Kryukovsky A.S. The scoring system as an assessment of the effectiveness of the student-teacher system/ A.S. Kryukovskiy, K.O. Sobetov // Youth science in regional

JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS

VOLUME 04, ISSUE 09
MONTHLY JOURNALS



ISSN NUMBER: 2751-4390

IMPACT FACTOR: 9,08

development: All-Russian materials of conferences of students and young scientists - Berezniki:
PGTU, 2011. – S. 11-14..