HUMAN COMPUTER INTERACTION
FALL 2024-2025

SYSTEM FOR STUDYING AND PROVIDING OPINIONS ON THE NUMBER OF STUDENTS ADMITTED EACH SEMESTER TO ACADEMIC PROGRAMS AT THE UNIVERSITY OF JORDAN

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1.0 INTRODUCTION:

Our project, "**System for Studying and Providing opinions on the Number of Students Admitted each Semester to Academic Programs at the University of Jordan**," addresses the challenges of gathering and analyzing department heads' feedback on the number of students to be admitted into the different academic programs in the Summer and winter admission cycles. Currently, this process is handled through inefficient, manual methods that are time-consuming and prone to errors, these errors cost the university of Jordan large sums of money that is paid in fines for exceeding the capacity and fees for applications to raise the capacity of programs. From an HCI perspective, the lack of an intuitive, user-friendly system leads to frustration and inefficiency, as users struggle with incoherent tools that fail to meet their needs.

The objective is to develop a user-friendly system that simplifies feedback collection and decision making. By applying HCI principles, the system will prioritize usability and efficiency, balancing trade-offs between usability goals and user experience. The goal is to improve communication and cooperation in the admissions process. Reducing the time required to make the decision and the expensive errors associated with it.

The project will proceed in key phases, starting with research to understand the needs of department heads and decision-makers. The design phase will focus on creating an intuitive interface, while the development phase will implement automated workflows and data visualization. Finally, usability testing will ensure the system meets user needs, delivering a practical, user-centered solution for improving the admissions process.

1.1 Need Analysis and Description

The need for this project arises from the significant challenges faced by the University of Jordan in managing the number of students admitted to its various academic programs in each admission cycle. The current procedures of gathering and analyzing feedback from various stakeholders (e.g., Heads of Departments, Deans, Vice Presidents, and other administrative roles) on the number of students to be admitted are manual, inefficient, prone to mistakes, and unintegrated. This slows down the decision-making process, result in financial penalties for exceeding program capacities and additional fees for raising capacity limits. Added to that, from a Human-Computer Interaction (HCI) perspective, the lack of an intuitive, user-friendly system leads to frustration and inefficiency among users.

The proposed system aims to collect and deliver feedback on student admissions, track the progress of the decision chain and provide the required data and calculations needed for making the decision.

1.2 Project Constraints:

The development of this system is subject to several constraints:

1.2.1.Time Constraints:

The system must be developed and implemented within a tight schedule to align with the University's admission cycles.

1.2.2 Technical Limitations:

The system must be compatible with existing University systems and infrastructure.

1.2.3 Data Privacy and Security:

The system must adhere to strict data privacy and security protocols to protect sensitive administrative data.

1.2.4. Stakeholder Expectations:

The system must meet the diverse needs of various stakeholders, including Heads of Departments, Deans, and Vice Presidents.

1.3 System environment

1.3.1. External Environment

1. **Stakeholders**:
   1.1. University administration, academic departments, and policy-makers.
   1.2. External accrediting bodies and the Ministry of Higher Education.
2. **Hardware and Infrastructure**
   2.1. **Servers**: Hosting the Oracle Database and application backend.
   2.2. **User Devices**: Computers, tablets, and smartphones used to access the system.
   2.3. **Network Infrastructure**: University networks providing connectivity for users.
3. **Legal and Regulatory Requirements**
   3.1. Compliance with data protection laws in Jordan.
   3.2. Adherence to university policies for data security and privacy.
4. **Market Trends**
   4.1. Increasing focus on data-driven decision-making in academia.
   4.2. Growing demand for transparency and public involvement in education policies.

5. **Network Conditions**
    5.1. Reliable internet connectivity within the University of Jordan's campus.
    5.2. Support for remote access by external users.

1.3.2. Internal Environment

1. **Development Environment**
    1.1. **Programming Language**: .NET for the application development.
    1.2. **Design Tools**: Figma for UI/UX design and prototyping.
    1.3. **Integrated Development Environment (IDE)**: Visual Studio for .NET development.
2. **Deployment Environment**
    2.1. **Database**: Oracle Database for managing data on students, opinions, and analysis.
    2.2. **Hosting**: On-premises servers or cloud solutions approved by the university.
    2.3. **Operating System**: Windows Server or a Linux distribution compatible with Oracle.
3. **Security Measures**
    3.1. Role-based access control to manage user permissions.
    3.2. Data encryption for sensitive information.
    3.3. Regular security audits and compliance checks.
4. **Team**
    4.1. Development Team
    4.2. Database Administrators (DBAs)
    4.3. UI/UX Designers
    4.4. Project Managers
5. **Data Sources**
    5.1. University records on student applications and acceptance numbers.

5.2. User-submitted opinions through surveys or forms.

1.4 Project Software and Hardware Requirements

1. Hardware Requirements

For Users:

1. **Devices**:
    1.1. Desktop or laptop with a modern web browser.
    1.2. Mobile devices (smartphones or tablets) with Android or iOS for mobile accessibility.

1. **Backup Devices**:
    1.1. Dedicated storage servers or cloud backup solutions

2. Software Requirements

For Users (Accessing the System):

1. **Operating System**:
    1.1. Windows 10 or higher, macOS 10.14 or higher, or the latest Android/iOS.
2. **Web Browser**:
    2.1. Any web browser.

For System Development and Hosting:

1. **Development Tools**:
    1.1. **Frontend**: HTML, CSS, Javascript

1.2. **Design**: Figma for UI/UX prototypes

1.5 Project Schedule:

Table 1: Project Schedule

Task ID	Description	Deadline
T1	Team formation	17/10/2024
T2	Project kickoff	8/12/2024
M1	Initial proposal submission	14/12/2024
T3	Requirements gathering and stakeholder interviews.	22/12/2024
T3	Design conceptualization and low-fidelity prototyping.	27/12/2024
M2	Stakeholder approval of low fidelity	29/12/2024
T4	Medium-fidelity prototyping	31/12/2024
T5	High-fidelity prototyping and system implementation.	4/1/2025
T6	System testing and heuristic evaluation.	8/1/2025

T7	Final documentation and project submission.	12/1/2025

2.0 Project Background and Existing Technologies

The current process for studying, and providing opinion on the number of student admissions per program at the University of Jordan is manual and relies on spreadsheets, face to face meetings, and paper-based forms. This leads to inefficiencies, errors, and delays in decision-making. Existing technologies, such as Student registration Systems, are not fully utilized for this specific process. The proposed system will leverage modern web technologies and HCI principles to create a digitized, more efficient and user-friendly solution.

3.0 Software Requirements Document

3.1 - Targeted Users:

The system will cater for the following user Roles:

1. **Head of Department**
2. **Dean**
3. **Vice President**
4. **Director of AQAC**

5. **Registrar General**

6. **Dean of Graduate Studies**

7. **Director of Accreditation Department**

3.2 Requirements Gathering and Customer Feedback Techniques

- We used interviews and prototyping to gather requirements and get customer feedback on our project.

  Interviews: We conducted multiple one-on-one interviews with Dr. Mohammad Abushariah (our main stakeholder). These were formal one on one interviews, and a mix between closed questions and open-ended questions were used to understand the problems he was facing with the current system, his requirements of the new system and to get his input on the low fidelity prototype to gather his feedback on the system's design and functionality

  Prototyping: Develop low-fidelity and high-fidelity prototypes to gather feedback on the system's design and functionality.

List of meetings:

14nd of December: the initial interview with Dr. Mohammad . The aim was to outline the goals, timeline, expected out comes and list the other involved stakeholders

22nd December: The aim of this interview was to discuss the specific functional requirements of each stakeholder. Outline the design choices and requirements that he had in mind for the prototype.

31st December: We scheduled a meeting with Dr. Abushariah to get his feedback on the low fidelity prototype and the functionality of the system. Colour schemes and choices were also discussed

3.3 Functional requirements

3.3.1 Head of Department

- Login

- View maximum capacity of enrolled students in each academic program (Bachelor Degree, Master Degree, Ph.D. Degree)

- View the number of currently enrolled students in each academic program (Bachelor Degree, Master Degree, Ph.D. Degree)

- Fill in the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree)

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree)

- Receive Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree)

- Receive Decision on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree)

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree)

- Logout

3.3.2 Dean

- Login

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Approve/Reject the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Receive Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Send Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments to Head of Departments

- Receive Decision on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Send Decision on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments to Head of Departments

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all academic departments

- Logout

3.3.3 Vice President

- Login

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Forward the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Director of AQAC, Registrar General, and Dean of Graduate Studies

- Receive Comments on Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools from Director of AQAC, Registrar General, and Dean of Graduate Studies

- Send Comments on Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) to respective Deans

- Approve/Reject the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Logout

3.3.4 Director of AQAC

- Login

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Forward the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Director of Accreditation Department

- Receive Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools from Director of Accreditation Department

- Send Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Vice President

- Approve/Reject the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Logout

3.3.5 Registrar General

- Login

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Write comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Send Comments on number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Vice President

- Approve/Reject the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Logout

3.3.6. Dean of School of Graduate Studies

- Login

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Write comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Send Comments on number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Vice President

- Approve/Reject the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Logout

3.3.7. Director of Accreditation Department

- Login

- Fill in the maximum capacity of enrolled students in each academic program (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Receive the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Write Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools.

- Submit Comments on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools to Director of AQAC

- Check Status of the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Print Reports on the number of students to be enrolled in each academic programs (Bachelor Degree, Master Degree, Ph.D. Degree) for all schools

- Logout

3.4 - Non-Functional Requirements:

3.4.1. Performance:

The system should handle large amounts of data efficiently, including processing admissions statistics for multiple programs and semesters in real-time.

3.4.2. Scalability:

It should accommodate an increasing number of users and growing data volumes as the university expands.

3.4.3. Security:

Sensitive data must be protected with robust security measures, including encryption and role-based access control.

3.4.4. Usability:

The interface should be intuitive and user-friendly with clear navigation and feedback mechanisms that do not require extensive training

3.4.5. Maintainability:

The system should allow for easy updates and modifications to accommodate changes in university policies or program structures.

3.4.6. Accessibility:

The system must comply with accessibility standards to ensure that all users, including those with disabilities, can use it effectively.

3.5 Usability and User Experience Goals

3.5.1 Usability Goals

1. **Effectiveness**
    - Ensure the system allows the targeted users to easily navigate the system and access relevant features
    - Enable accurate calculations of student capacity and ensure compliance with accreditation limits.
2. **Efficiency**

- Minimize the time required to retrieve and process data about academic programs.
- Automate repetitive tasks, such as capacity checks and data consolidation, to improve workflow.

3. **Memorability**

   We used a consistent design layout, clear navigation, and standardized features to make the system easy to remember for infrequent users.

   4. Security

   The access to the system requires a username and password to prevent unauthorized access and to maintain the confidentiality of the data
   Access to different features within the system is role based

3.5.2. User experience goals

Engagement

- Use interactive features such as drop down menus to keep users engaged.
- Implement real-time feedback (e.g., progress bars) to inform users of actions taken.

Helpful

- System helps in performing the required task while reducing cognitive load and increasing satisfaction.

4.0 System design document

4.1. Low fidelity prototyping

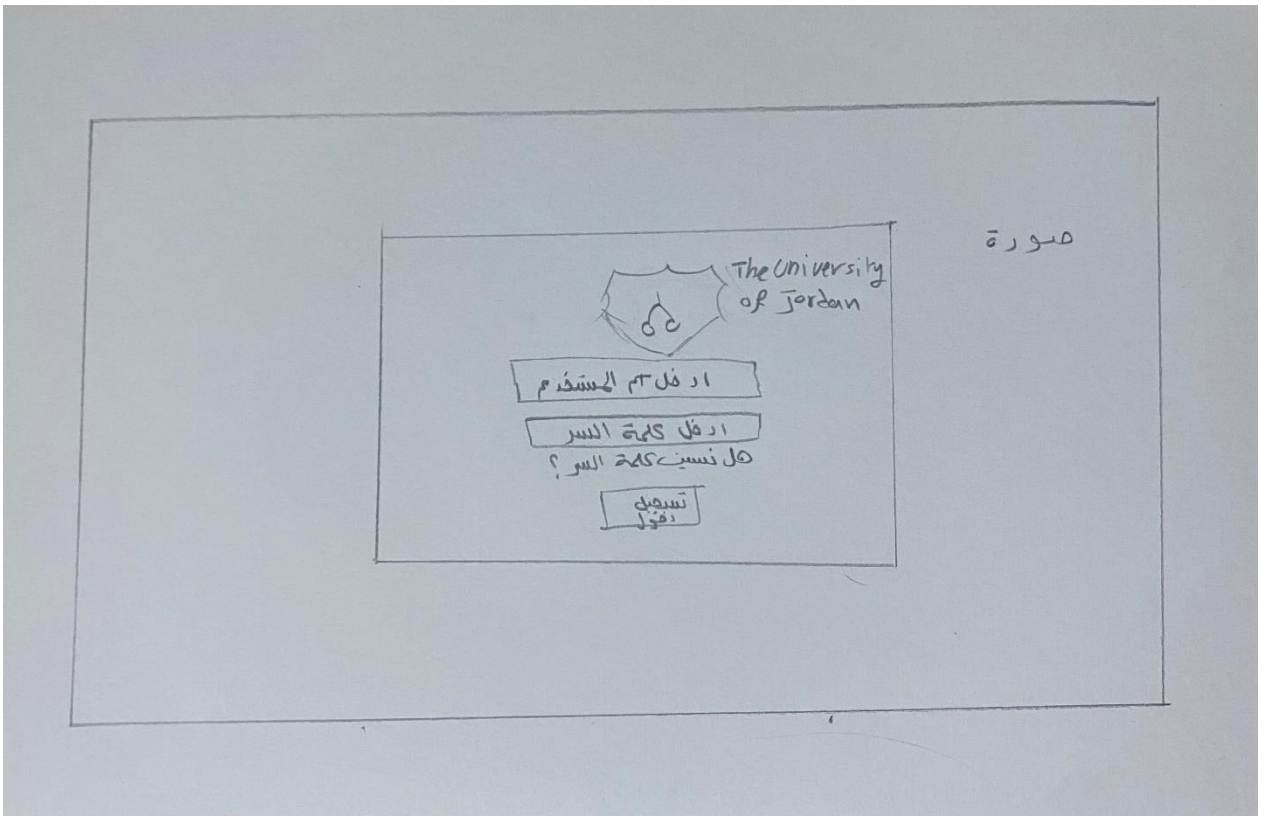

Figure 1 log in low fidelity

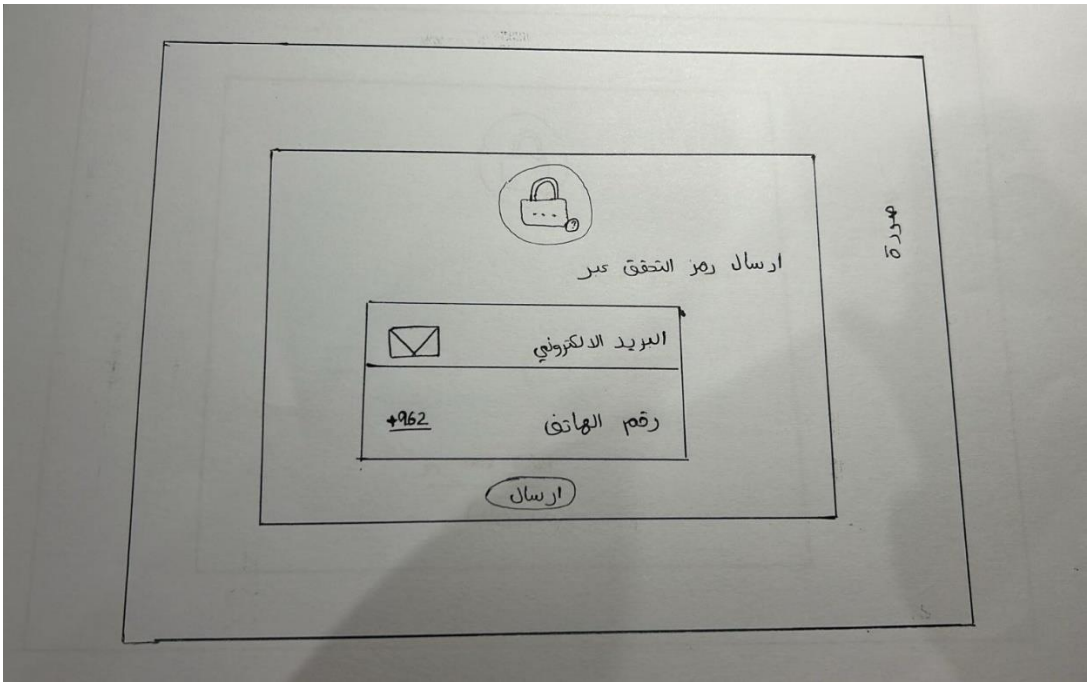

Figure 2log in low fidelity access code

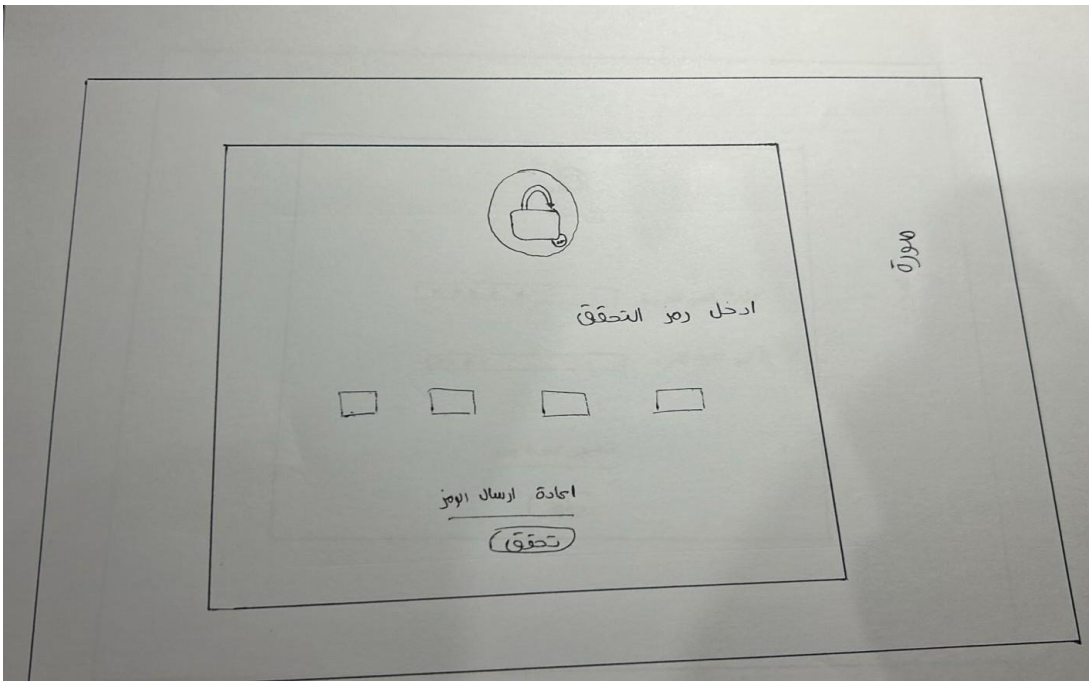

Figure 3log in low fidelity enter access code

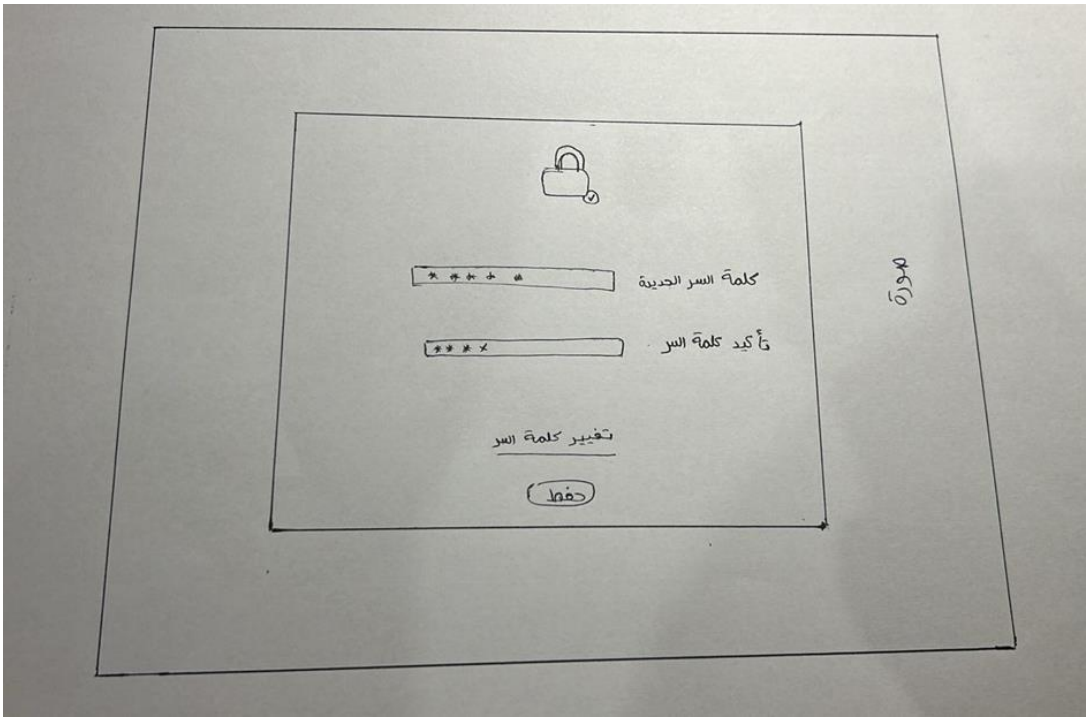

Figure 4 log in reset password

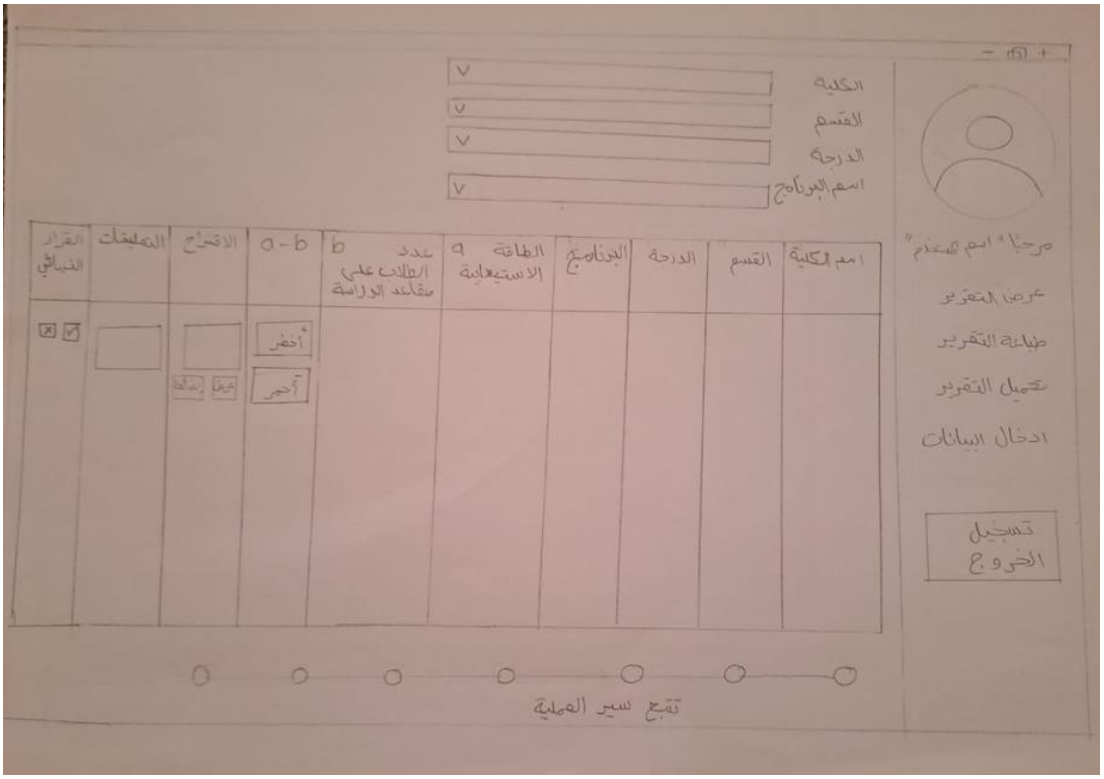

Figure 5 Director of accreditation page

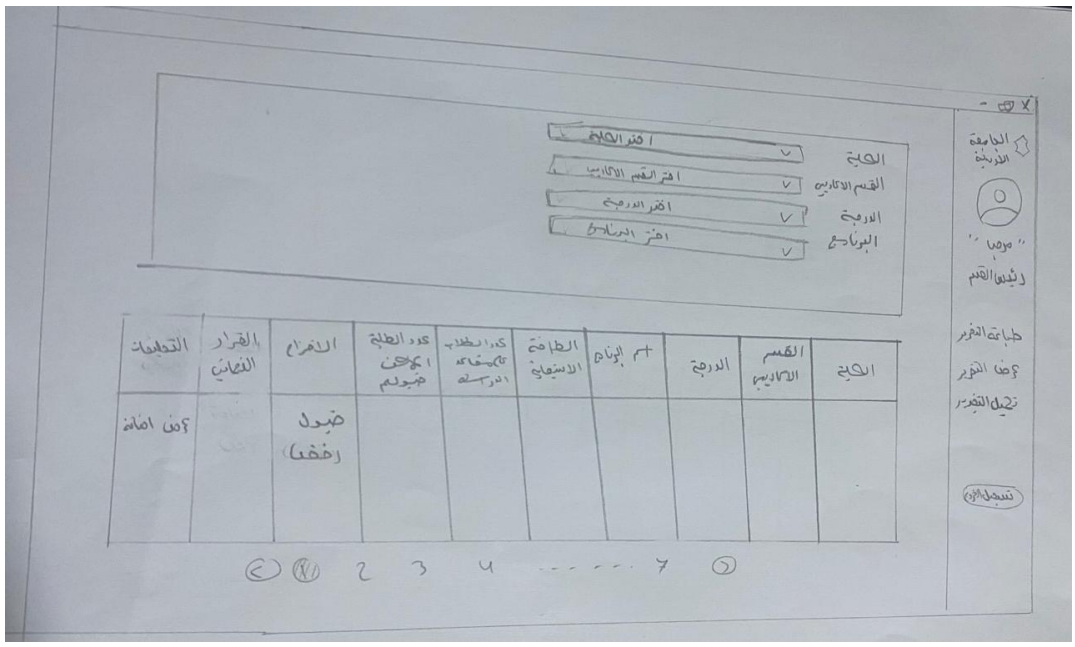

Figure 6 Head of department

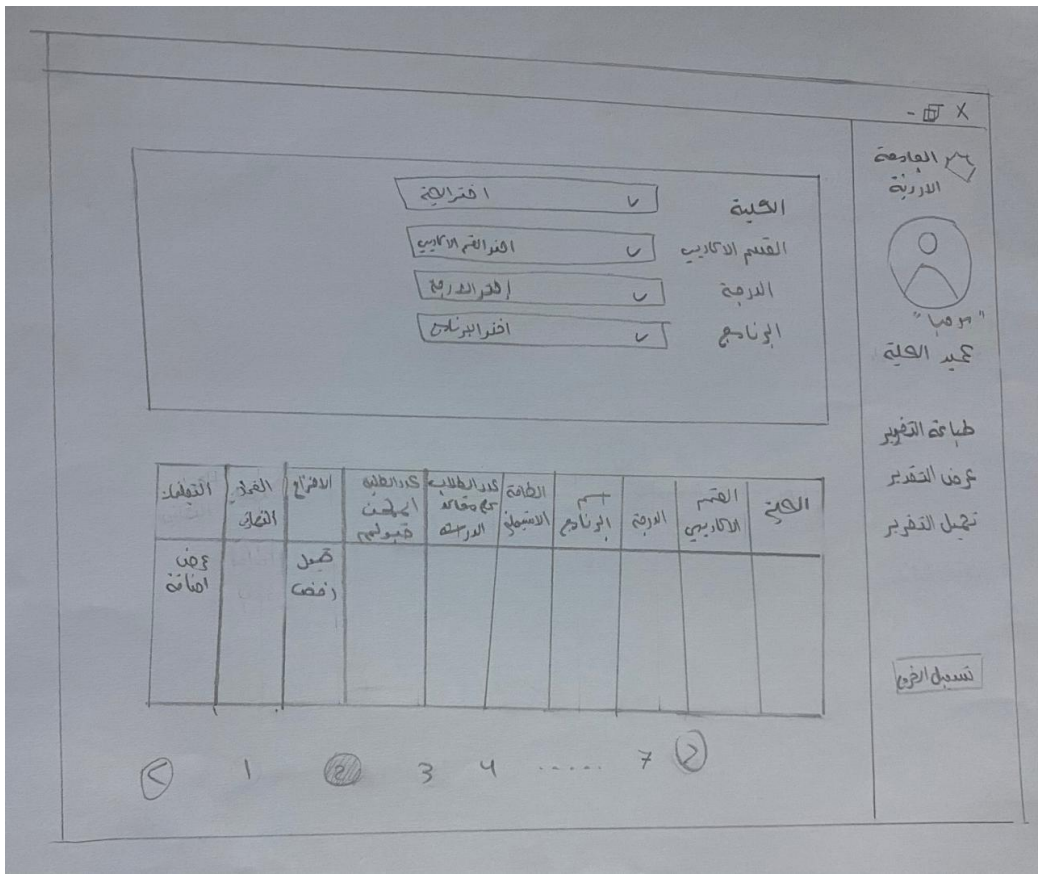

Figure 7 Dean

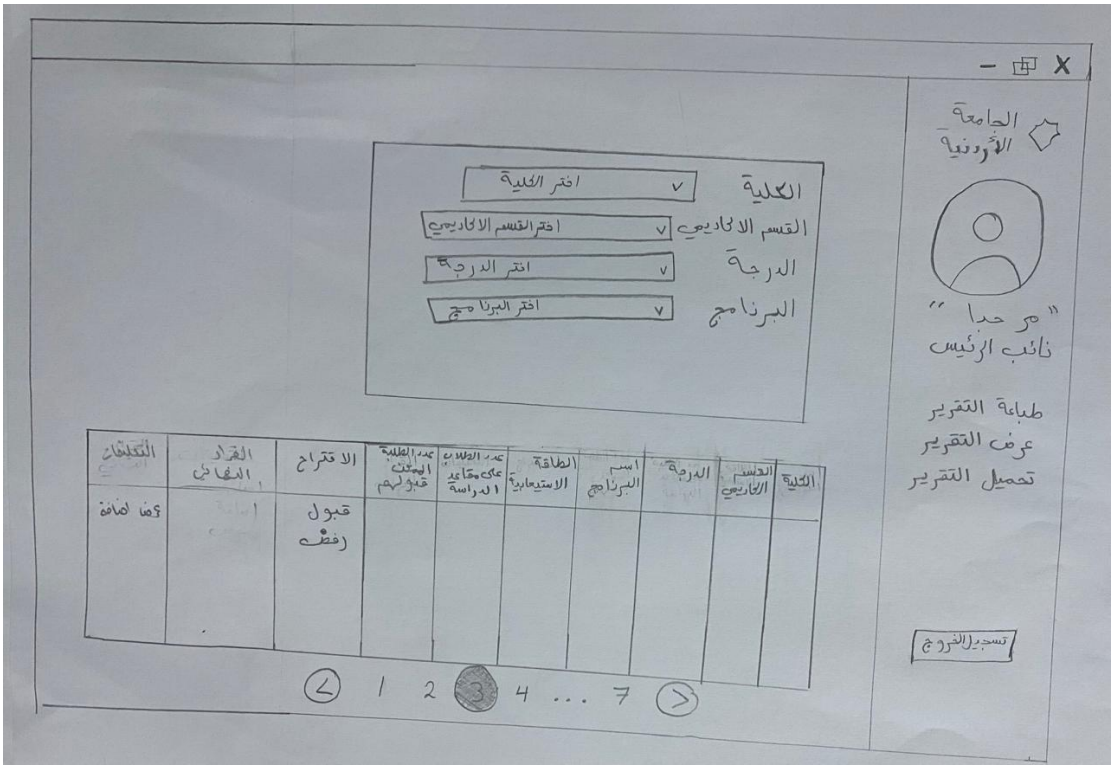

Figure 8 Vice president

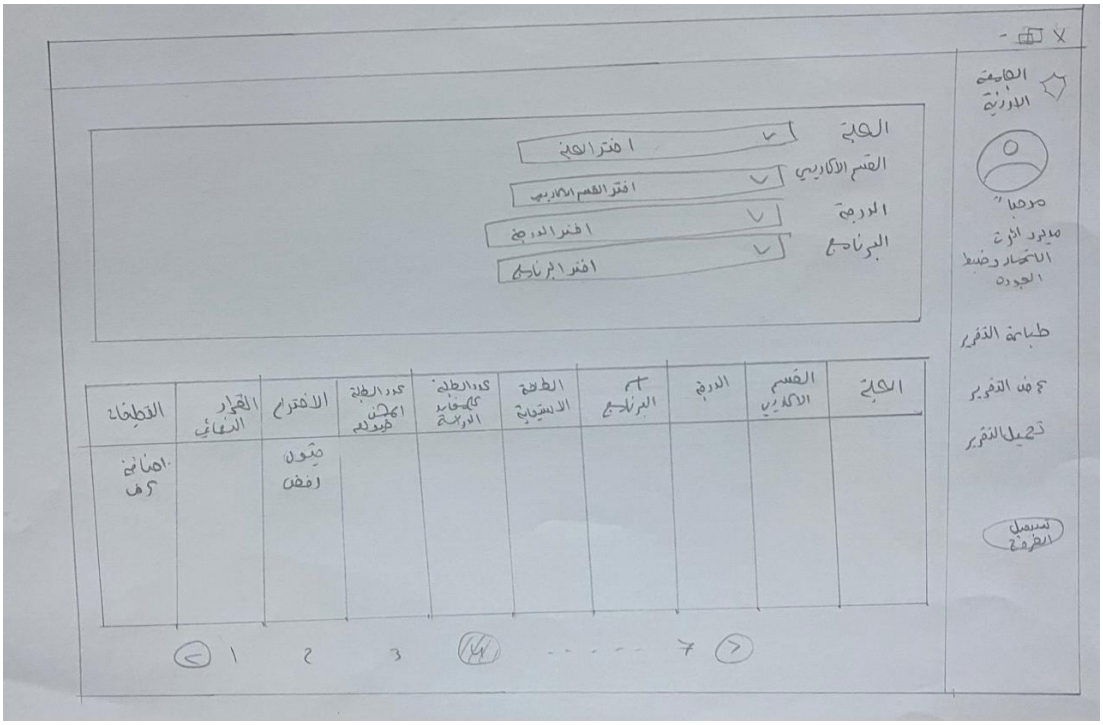

Figure 9 Director of AQAC

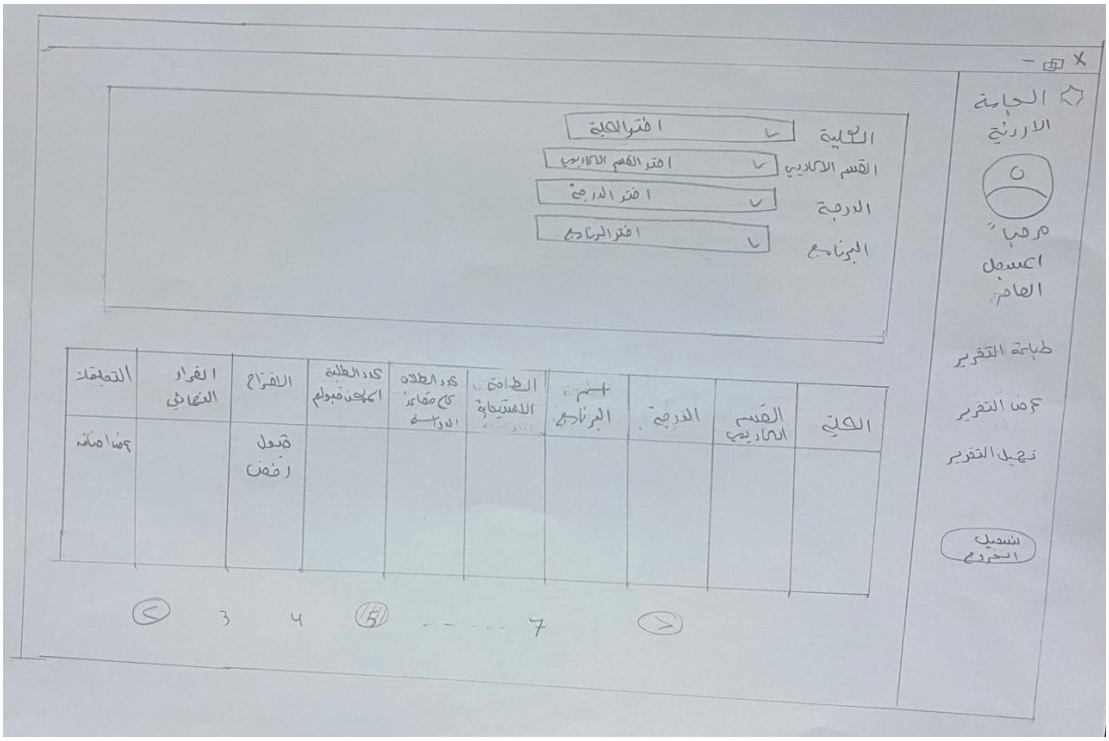

Figure 10 Registrar General

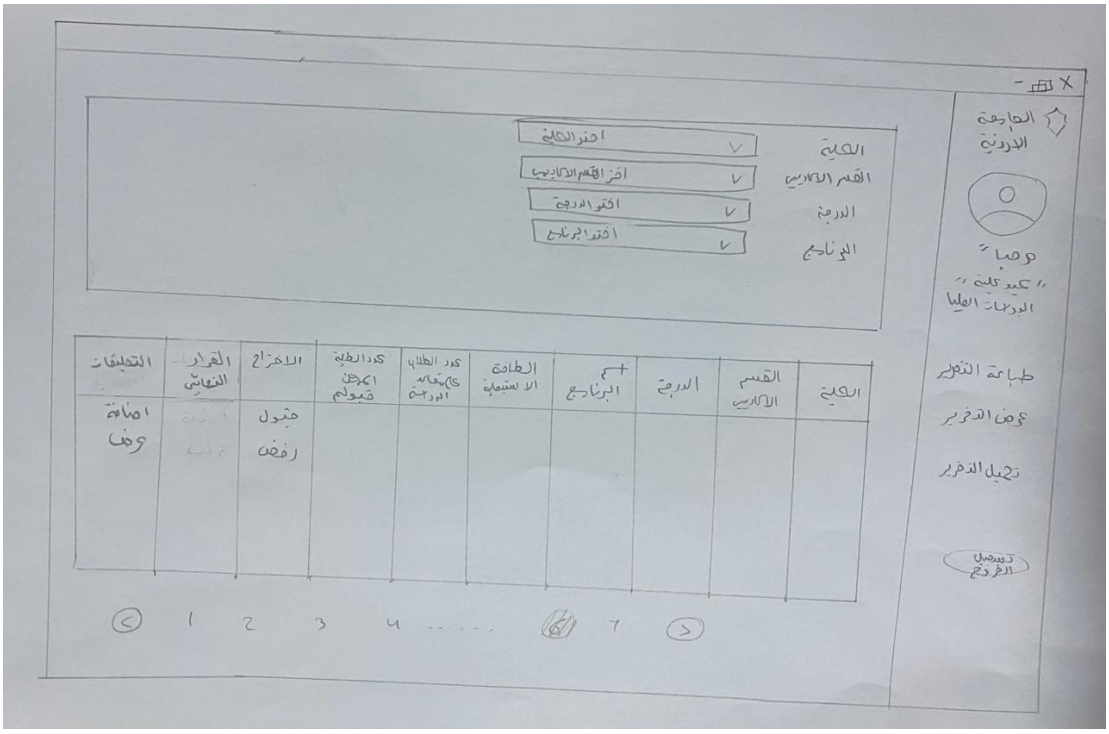

Figure 11 Dean of school of graduate studies

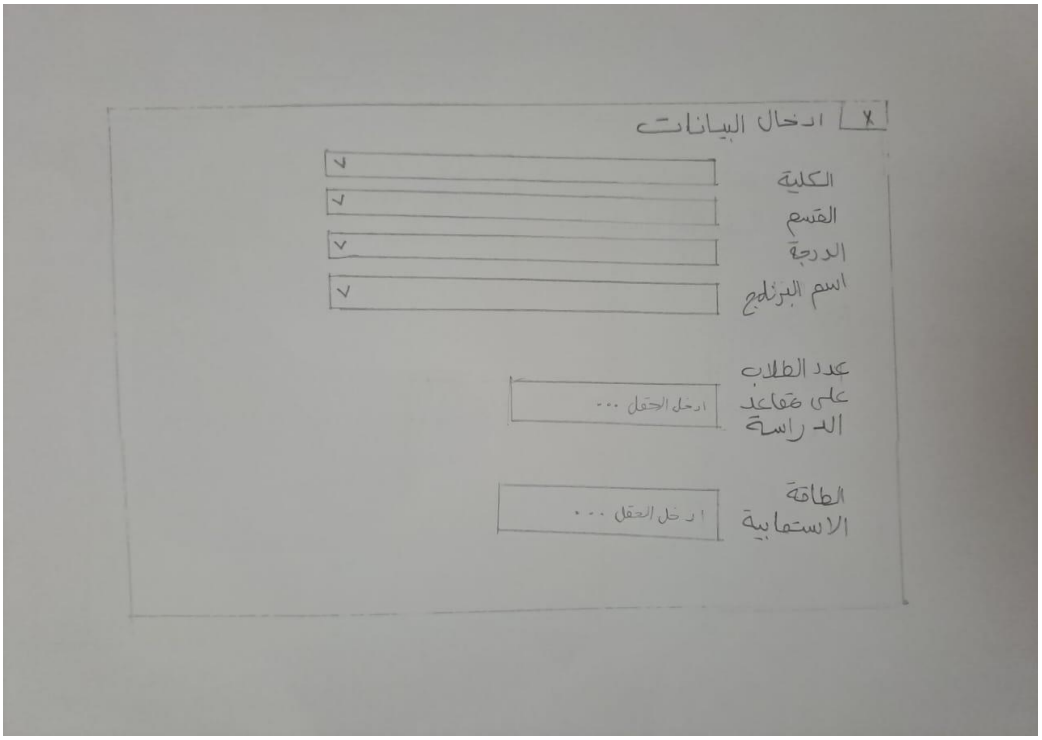

Figure 12 enter data

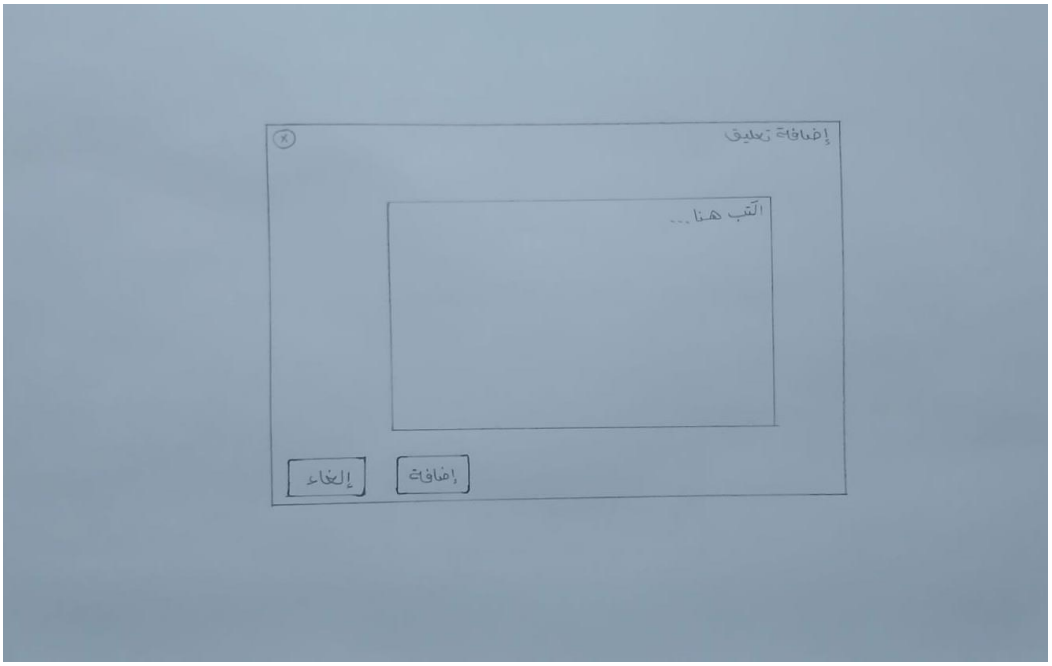

Figure 13 add comment

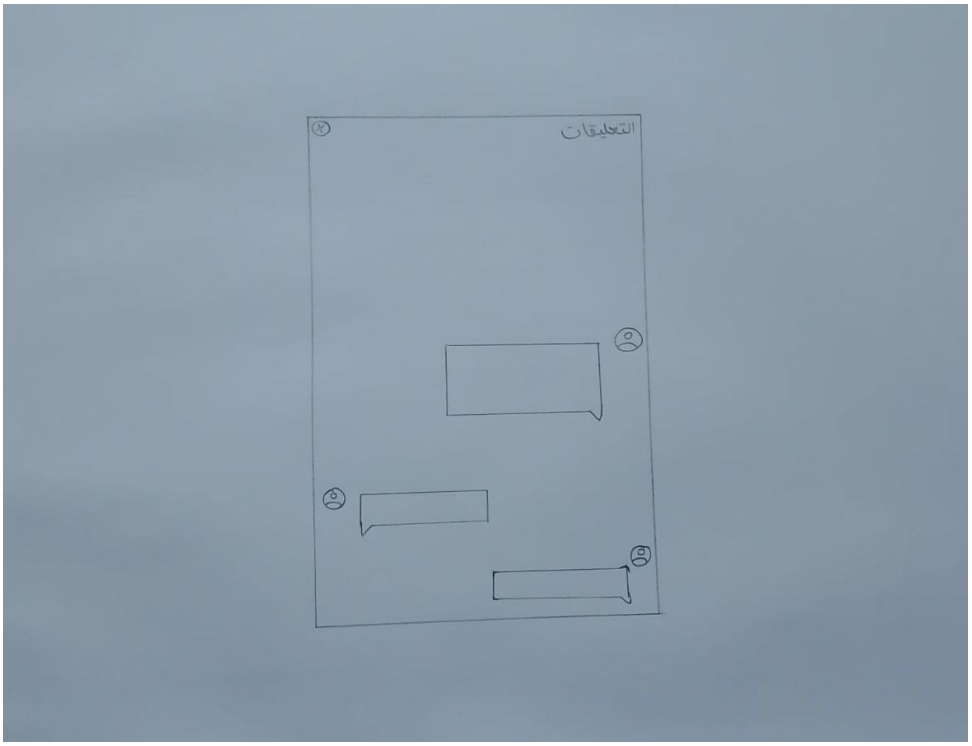

Figure 1413 view comment

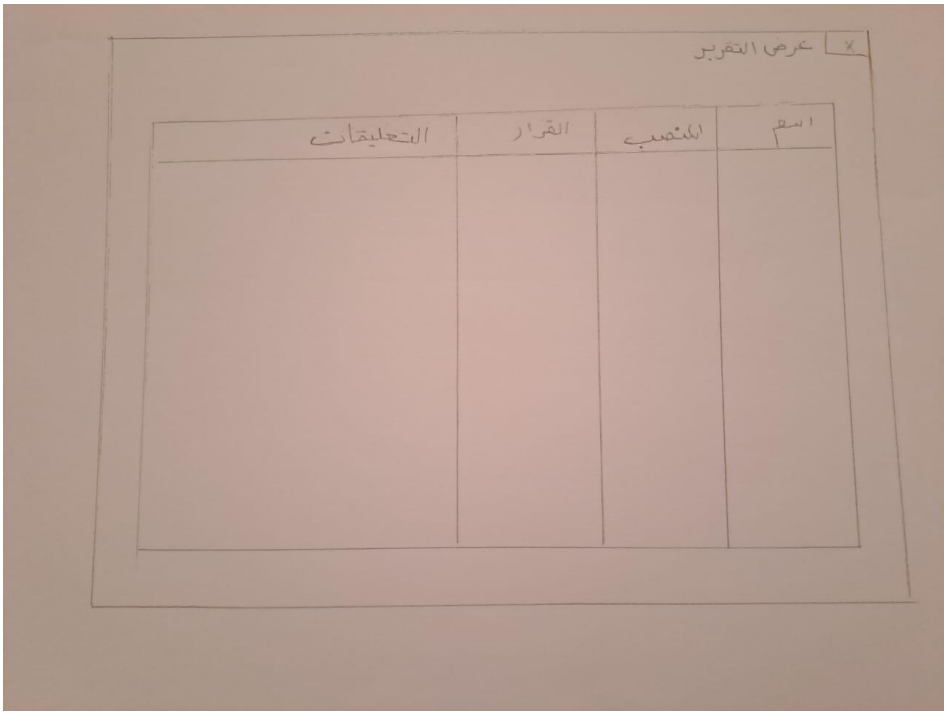

Figure 15 view report

4.2. medium fidelity prototyping

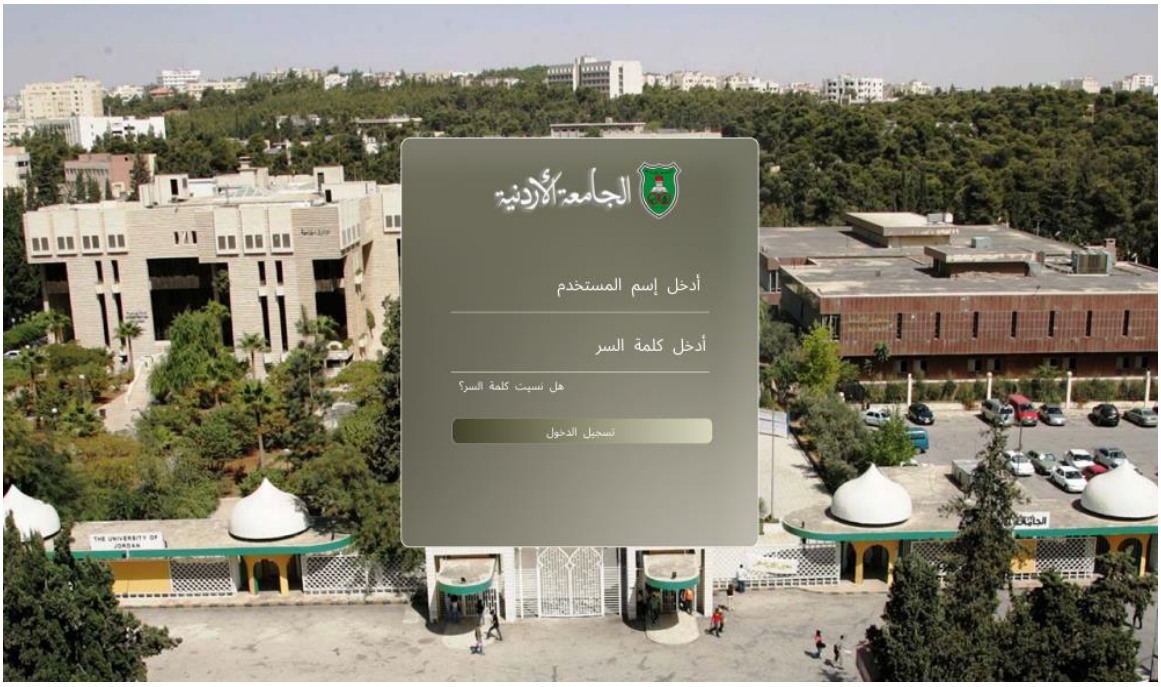

Figure 16 medium fidelity log in

Figure 14 medium fidelity send access code

Figure 15 medium fidelity access code

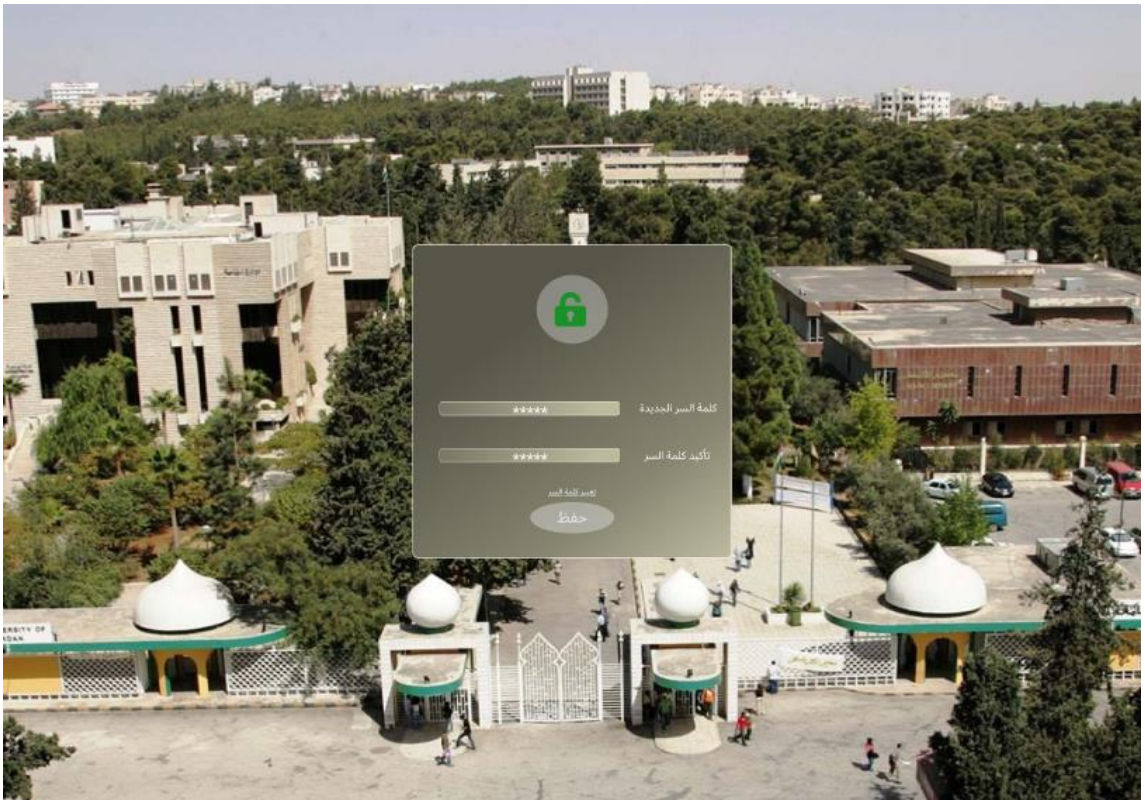

Figure 16 Medium fidelity reset password

Figure 17 Medium fidelity head of department

Figure 18 medium fidelity dean

Figure19 Medium fidelity Vice president

Figure 20 Medium fidelity Director of AQAC

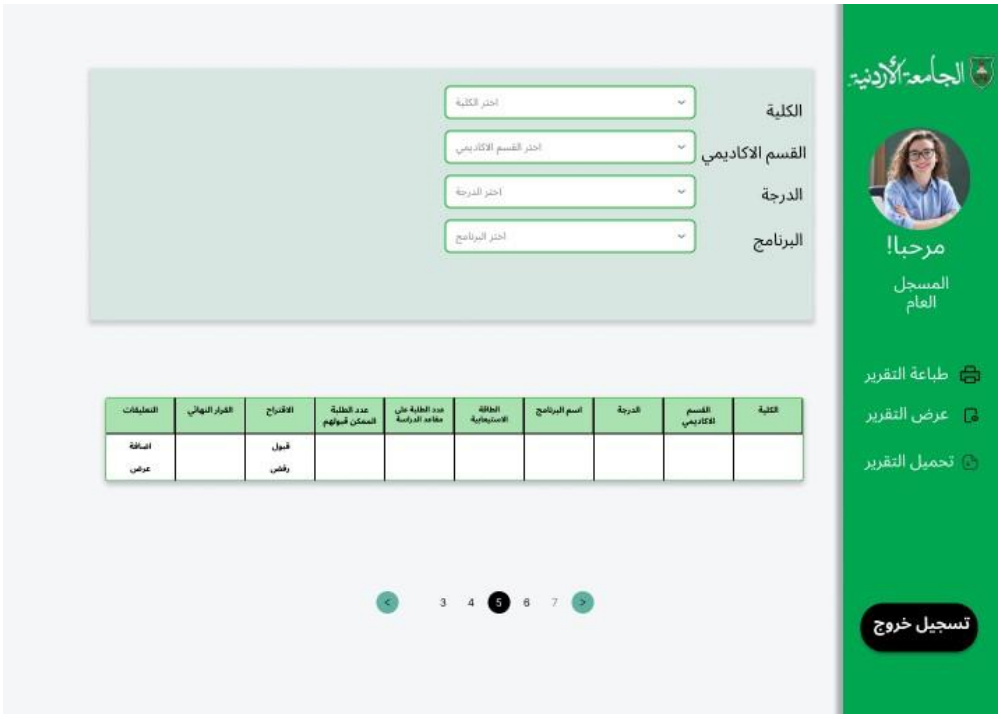

Figure 21 Medium Fidelity registrar general

Figure 22 Medium Fidelity dean of graduate studies

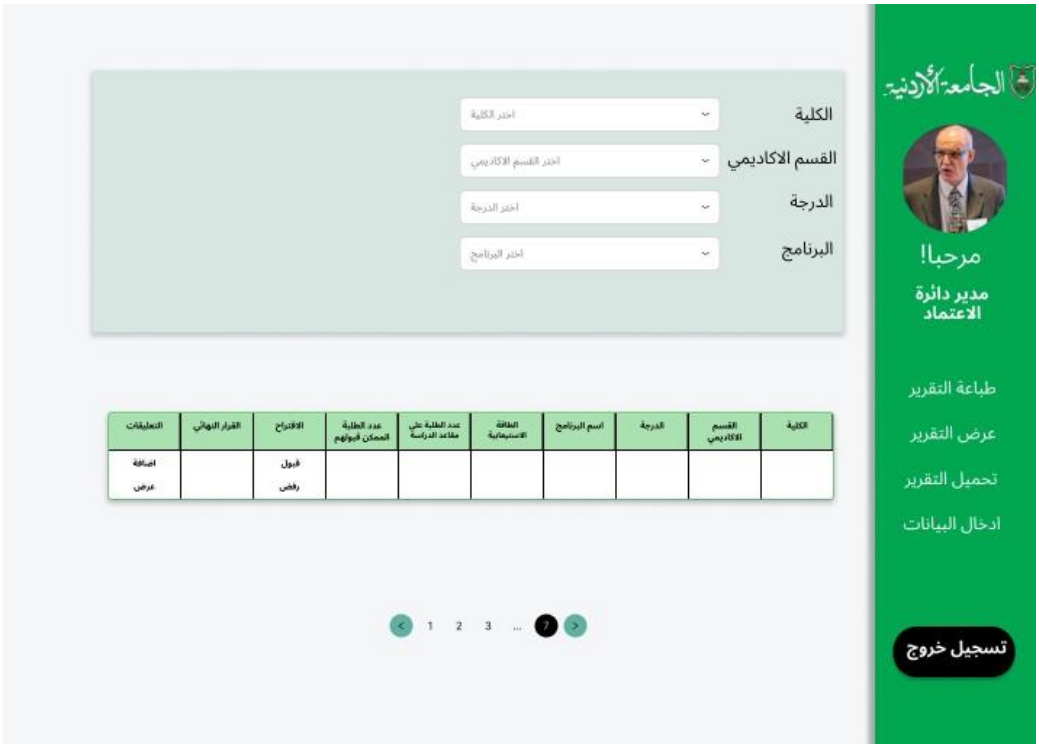

Figure 23Medium fidelity Director of accreditation

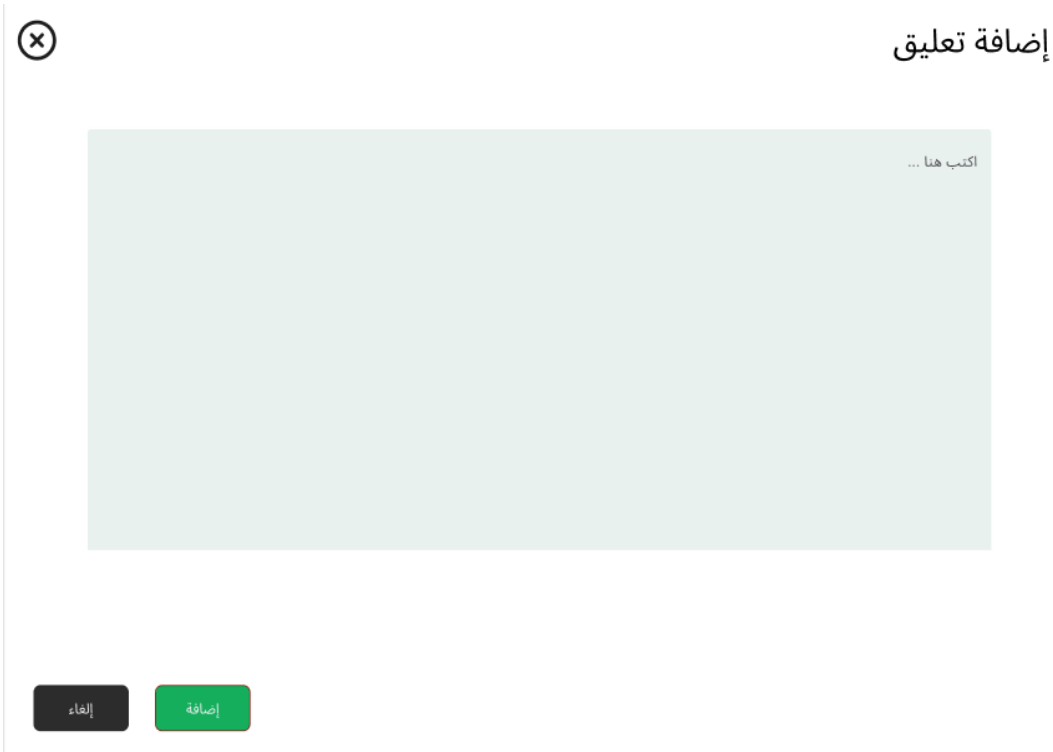

Figure 24 Medium fidelity add comment

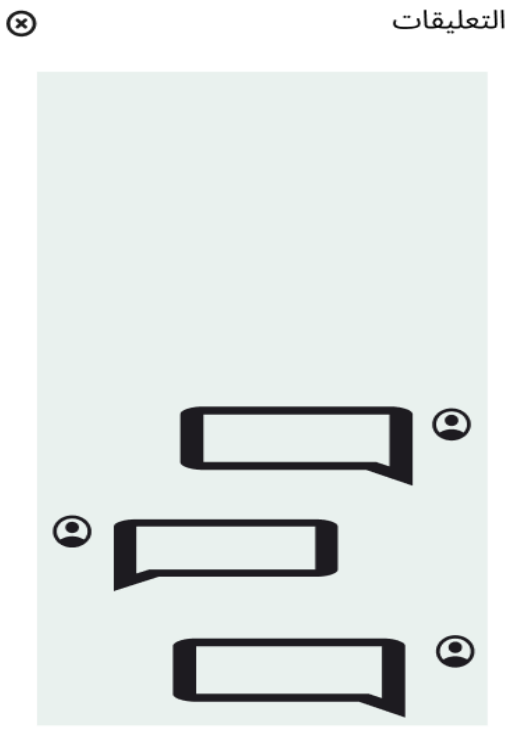

Figure 25 Medium fidelity view comment

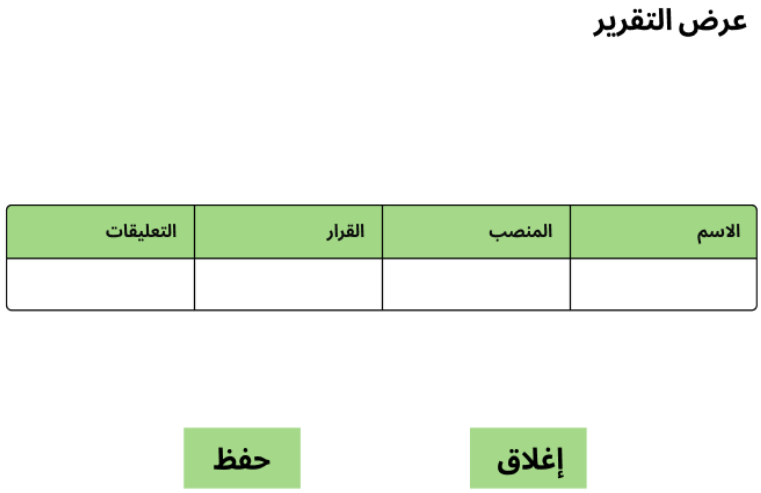

Figure 26 Medium fidelity show report

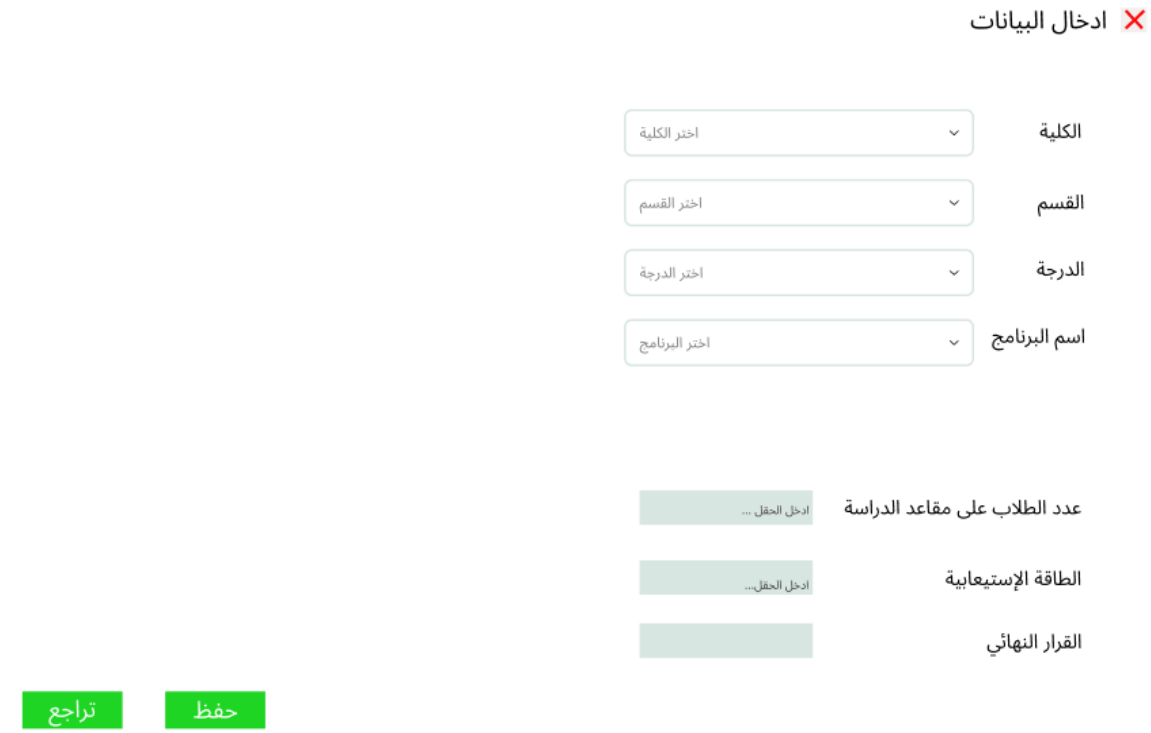

Figure27 Medium fidelity enter data

5.0 System implementation

5.1 High fidelity prototyping

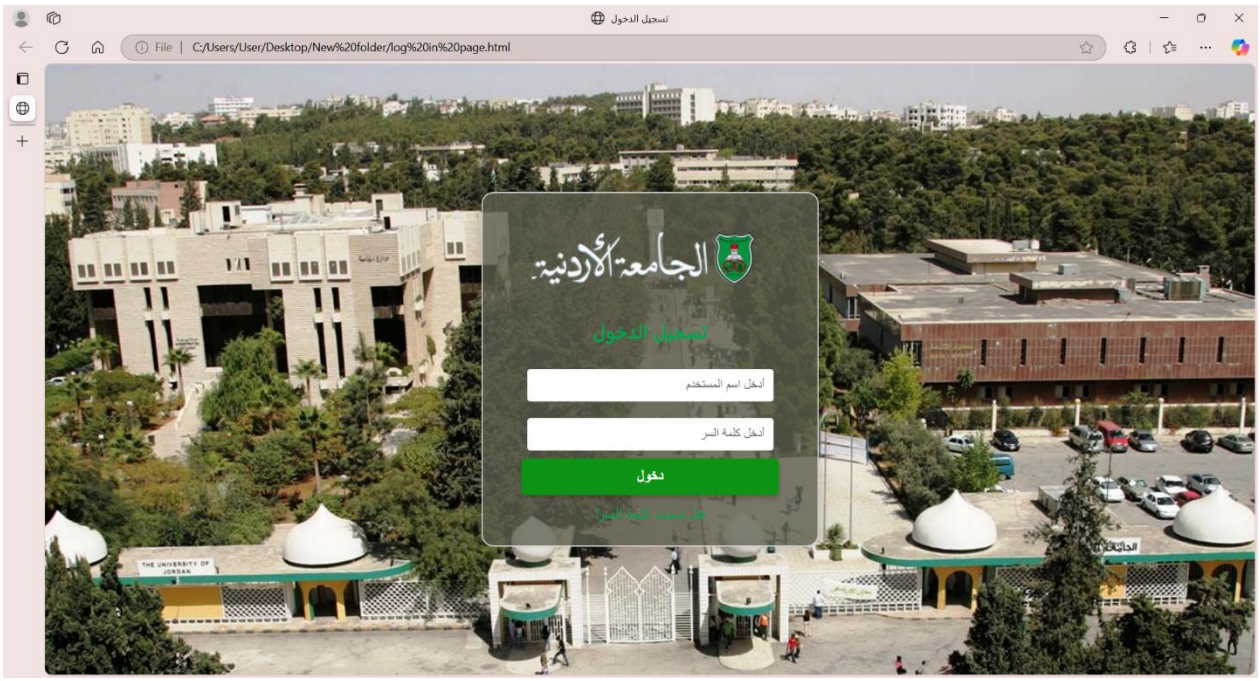

Figure 28 log in

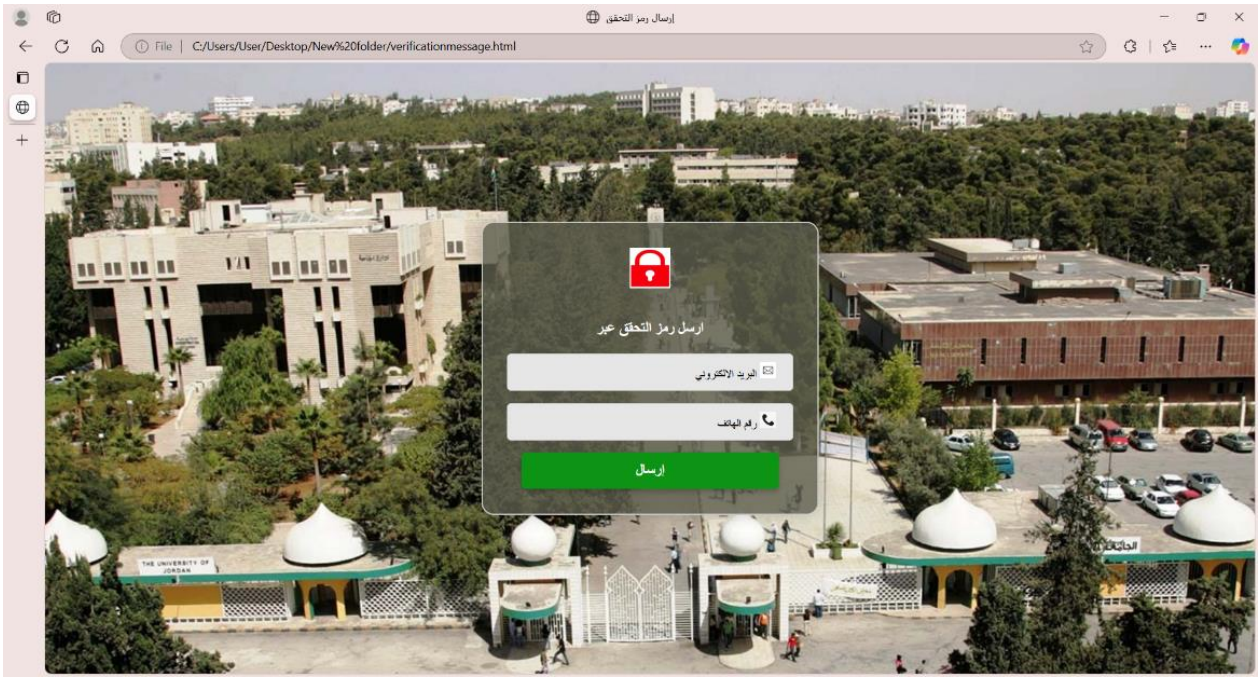

Figure request verification29

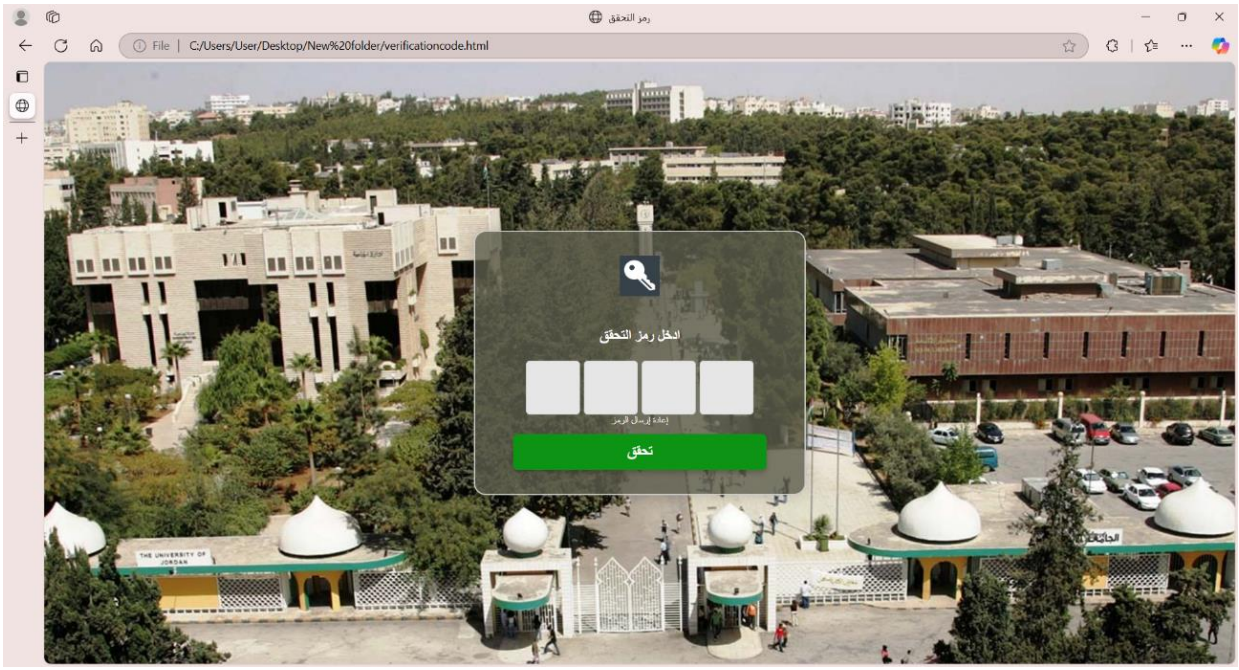

Figure 30 Verification code

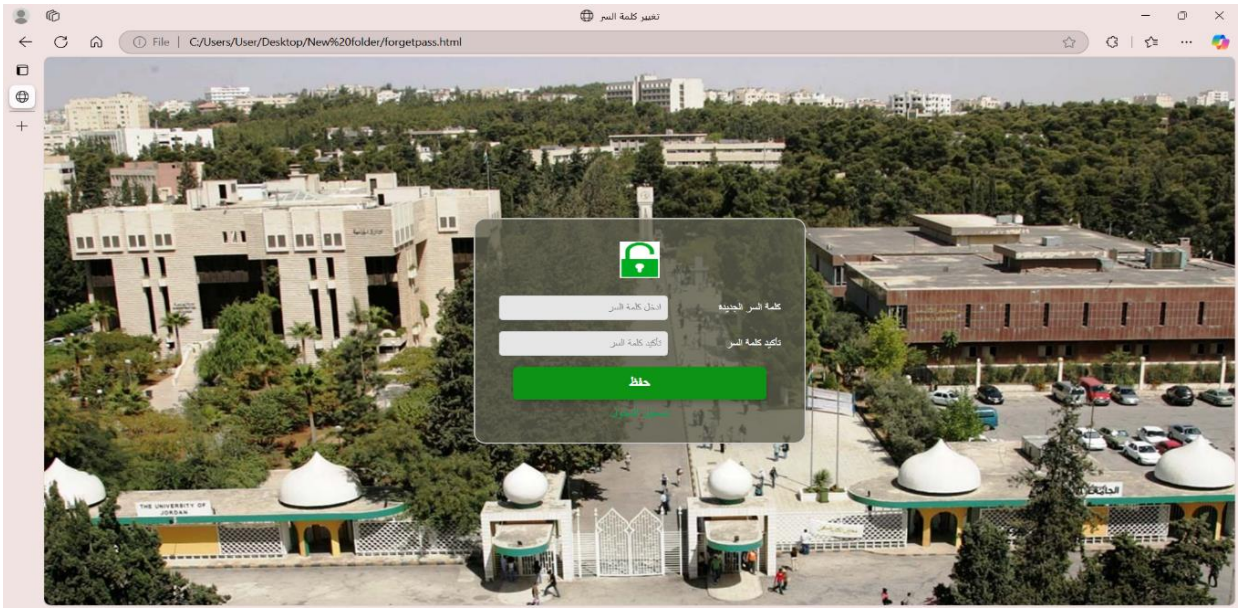

Figure31 Reset password

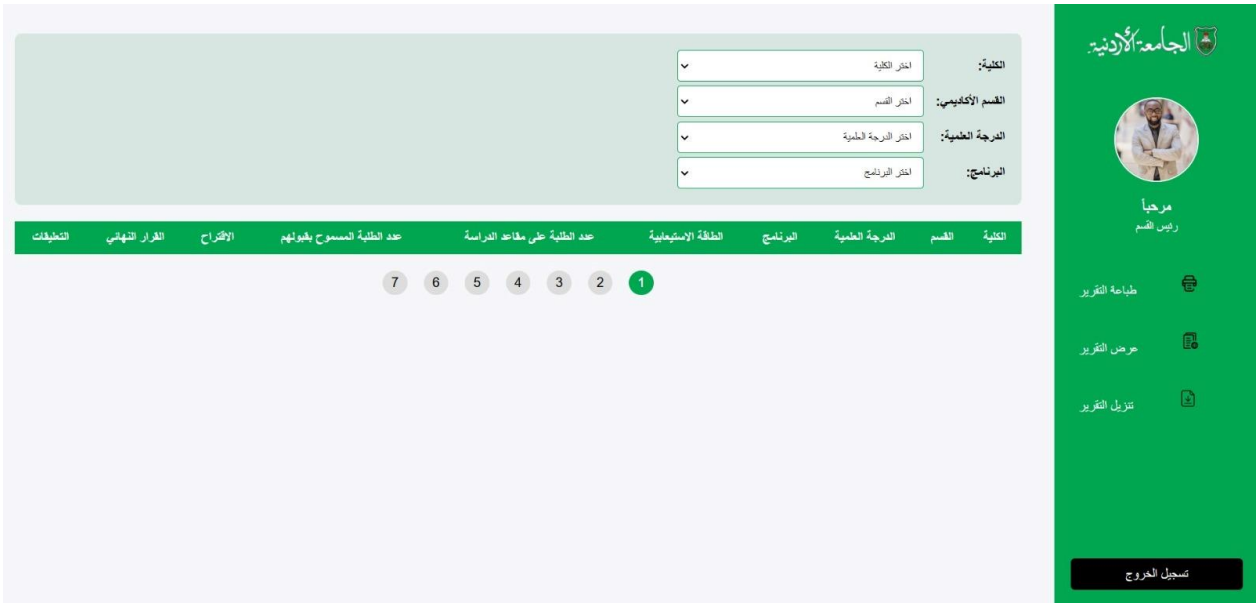

Figure32 User 1

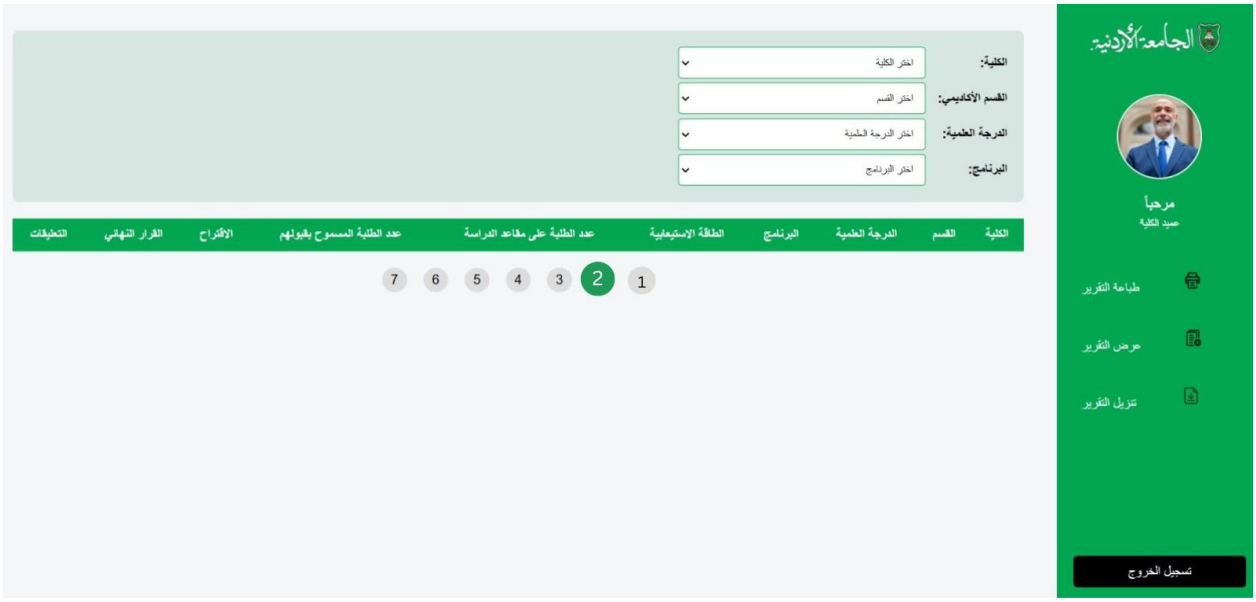

Figure 33 user 2

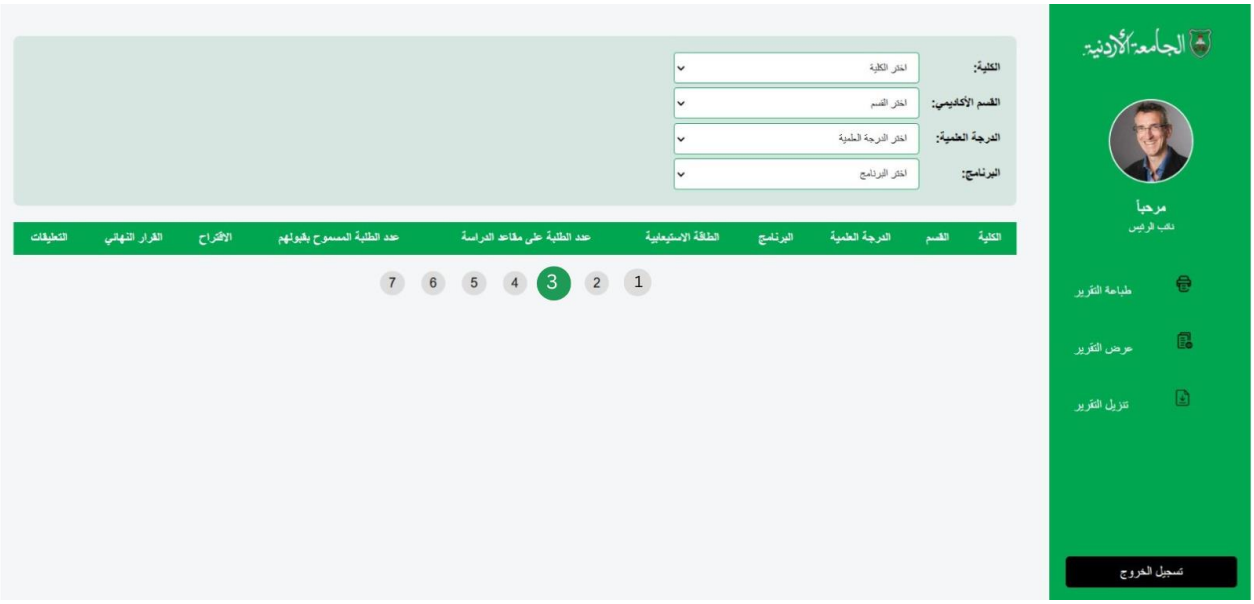

Figure 34 User 3

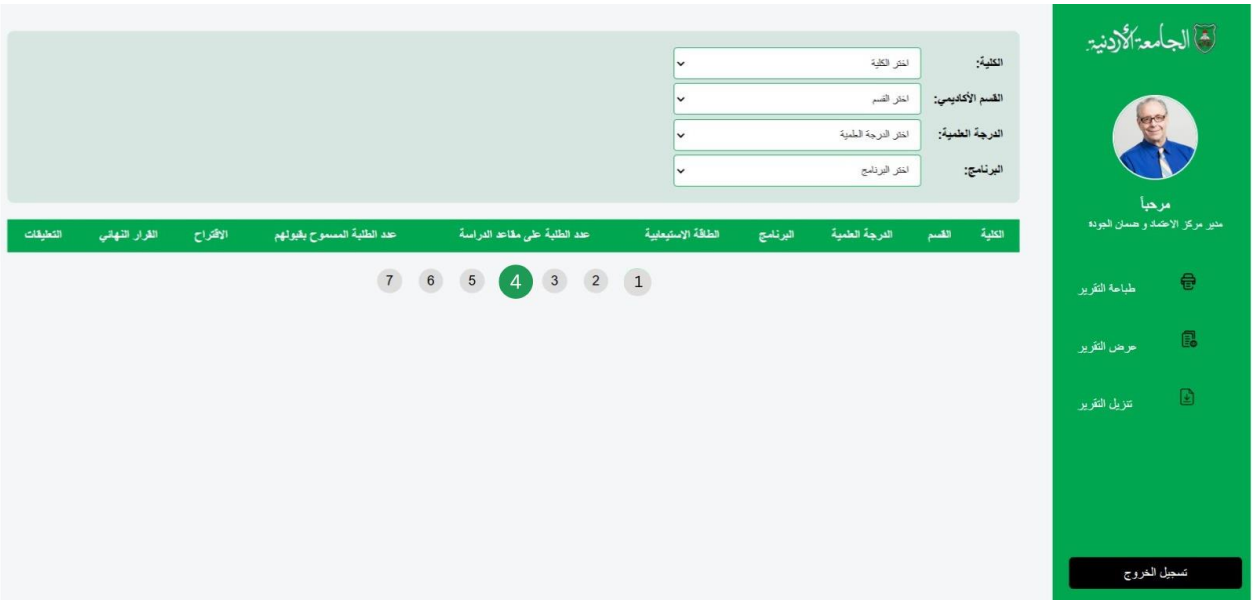

Figure 35 user 4

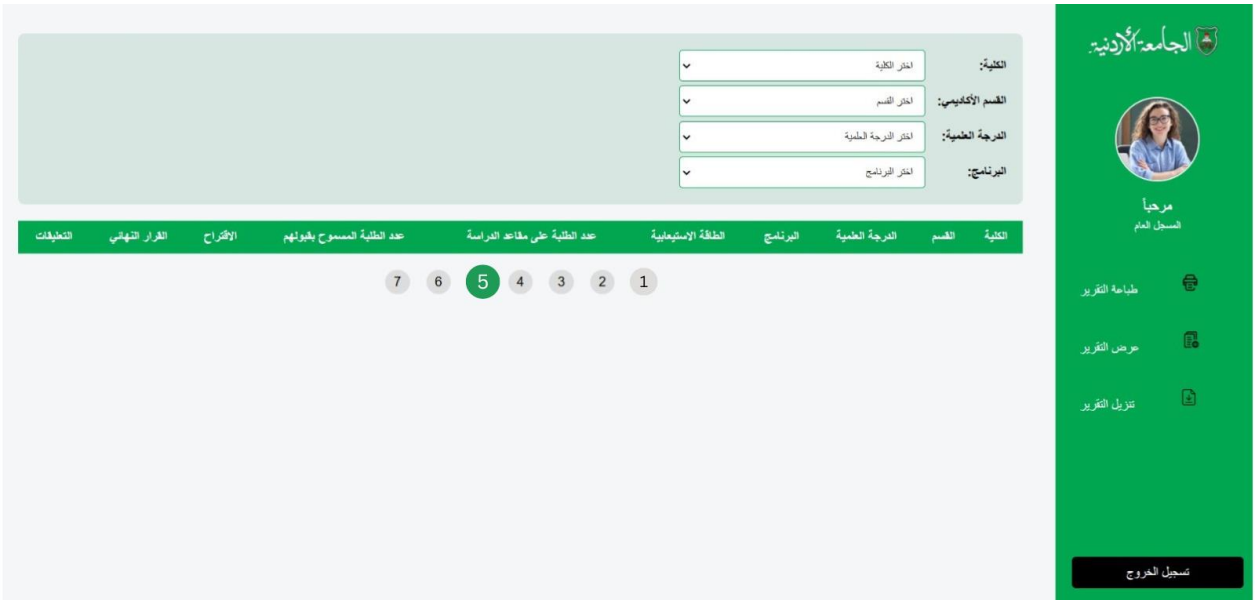

Figure 36 user 5

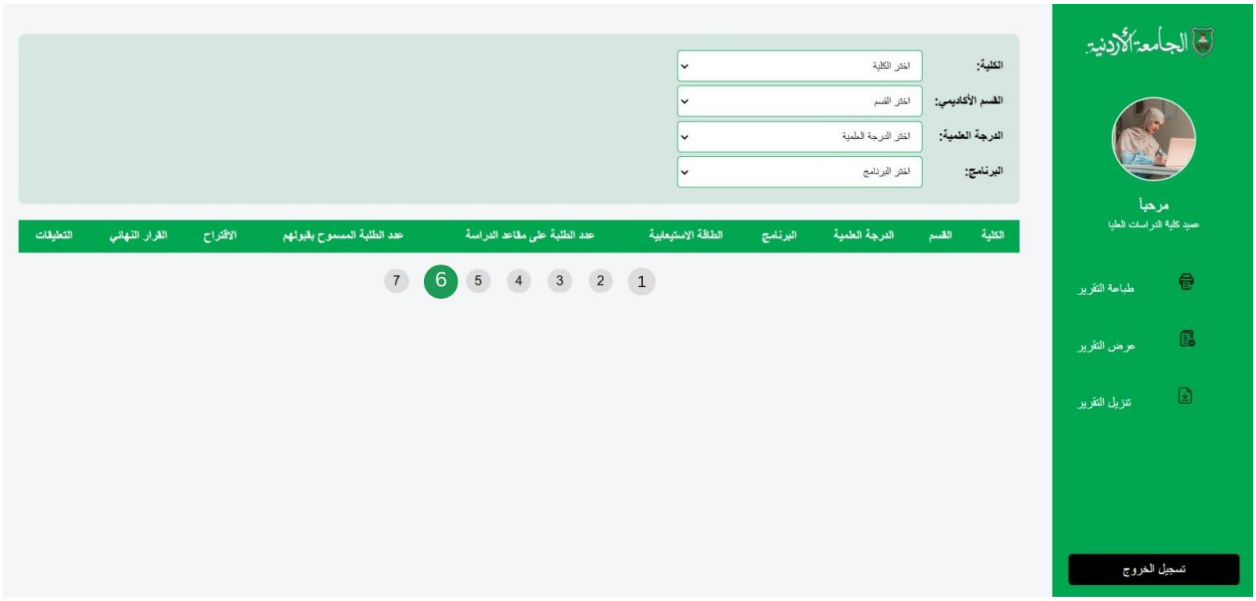

Figure 37 User 6

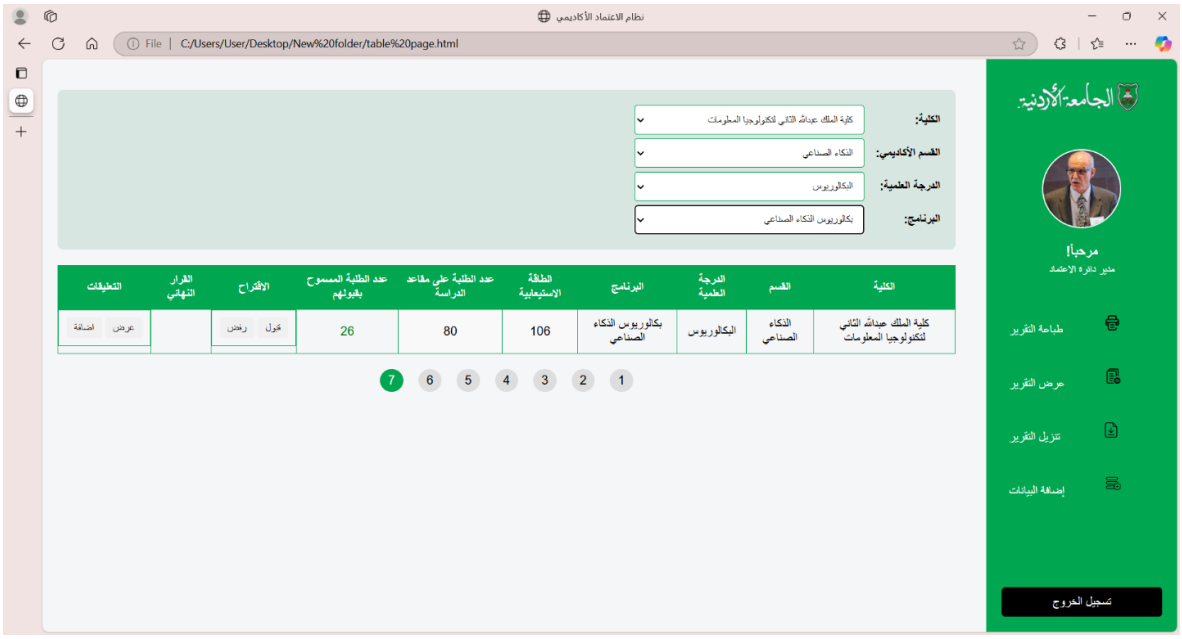

Figure38 user 7

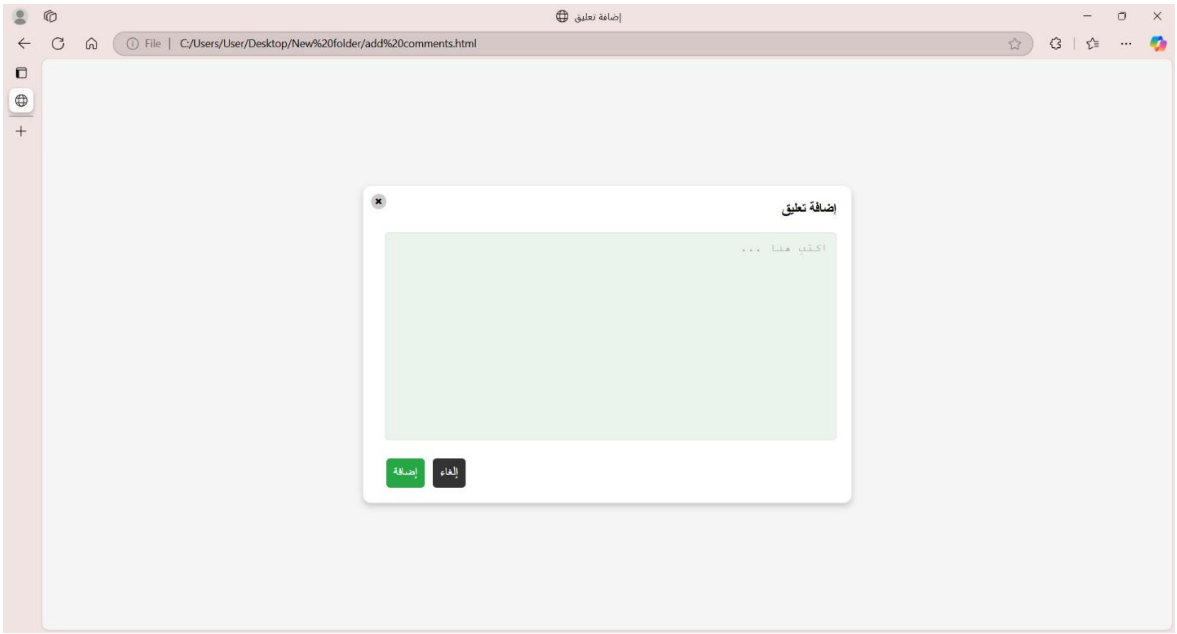

Figure 39 Add comment

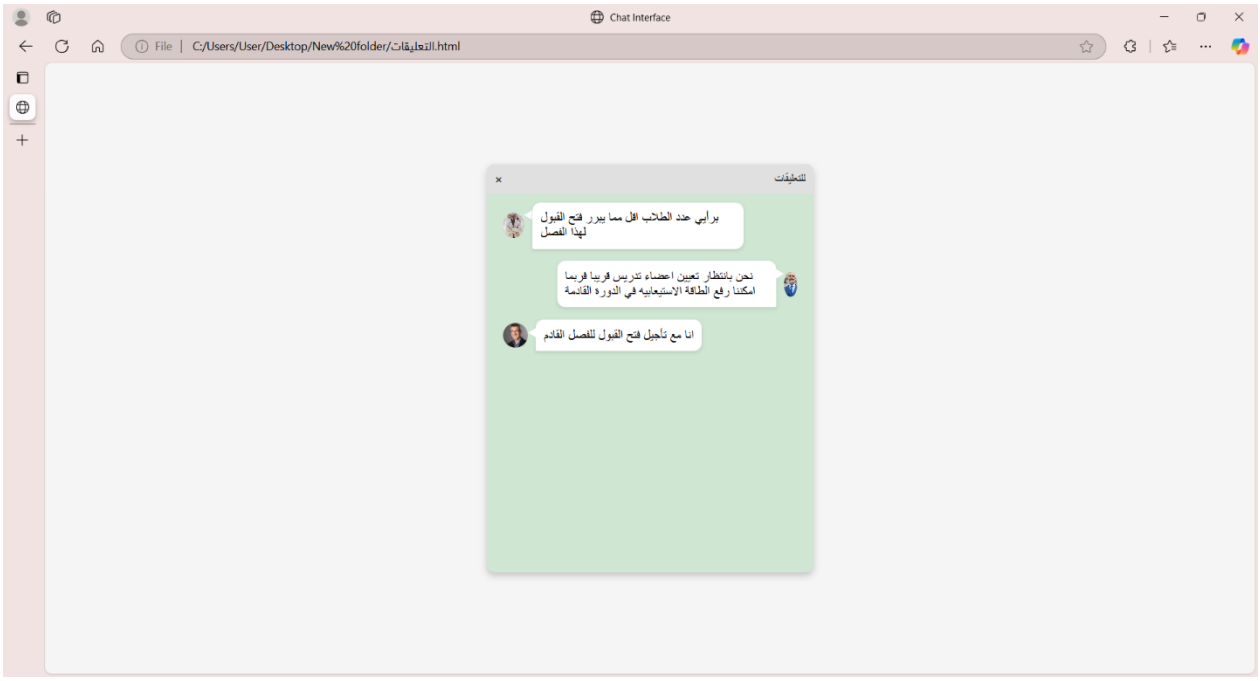

Figure 40 View comment

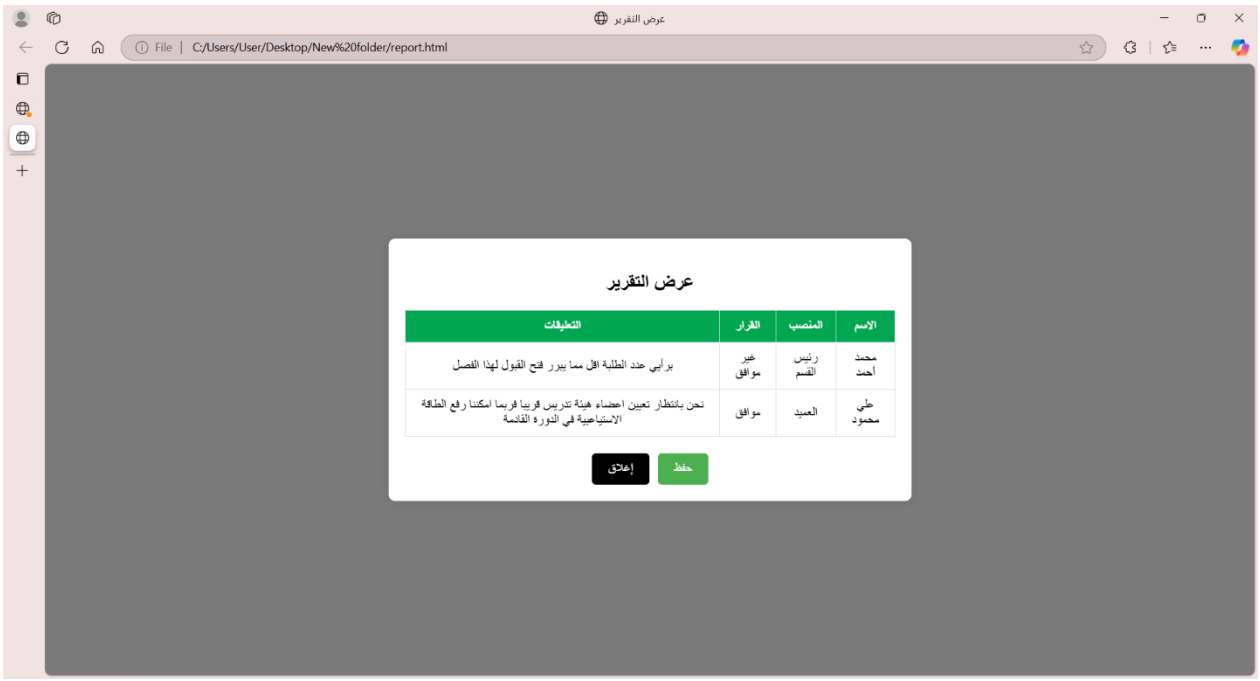

Figure 41View report

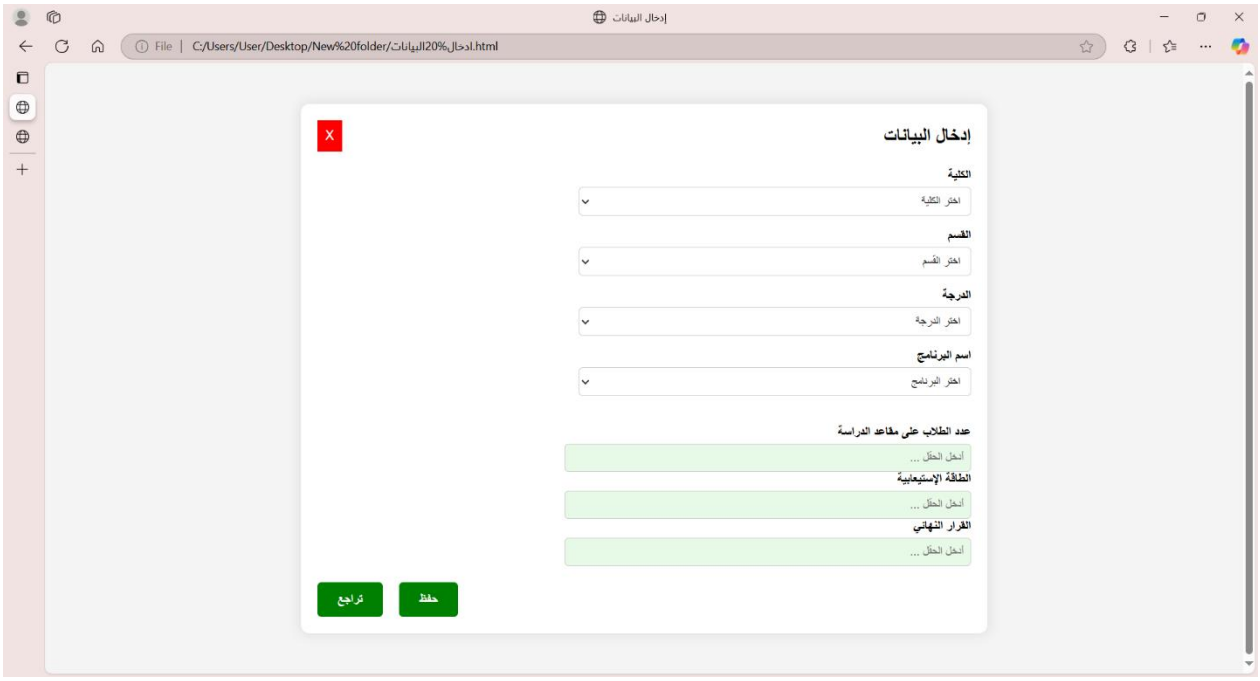

Figure42 Add data

6.0 System testing and installation

6.1 Heuristic evaluation

According to Wikipedia, heuristic evaluation is a discount usability inspection method for computer software that helps to identify usability problems in the user interface (UI) design. It specifically involves evaluators examining the interface and judging its compliance with recognized usability principles (the "heuristics").

Heuristic evaluation is an informal usability inspection technique developed by Jakob Nielsen and his colleagues in 1994 in which experts, guided by a set of usability principles known as heuristics, evaluate whether user-interface elements, such as dialog boxes, menus, navigation structure, online help, etc., conform to the principles.

These evaluation methods are now widely taught and practiced in the New Media sector, where UIs are often designed in a short space of time on a budget that may restrict the amount of money available to provide for other types of interface testing. Nielsen's heuristic evaluation approach was used as detailed in the checklist of Usability Analysis and Design from Xerox Corporation (1995) downloaded from (http://www.stcsig.org/usability/resources/toolkit/toolkit.html#heuristics, accessed October 2010). Table 1 lists the heuristics of usability evaluation and their descriptions.

Table 2: List of Heuristics of Usability Evaluation and their Descriptions

Numbering Scheme	Heuristics	Description
H1	**Visibility of system status**	The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
H2	**Match between system and the real world**	The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
H3	**User control and freedom**	Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave

		the unwanted state without having to go through an extended dialogue. Support undo and redo.
H4	**Consistency and standards**	Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.
H5	**Error prevention**	Even better than a good error message is a careful design that prevents a problem from occurring in the first place.
H6	**Recognition rather than recall**	Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
H7	**Flexibility and efficiency of use**	Accelerators -- unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

H8	**Aesthetic and minimalist design**	Dialogues should not contain information that is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
H9	**Help users recognize, diagnose, and recover from errors**	Error messages should be expressed in plain language (no codes), precisely indicating the problem, and constructively suggesting a solution.
H10	**Help and documentation**	Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

In order to produce a meaningful heuristic evaluation of usability problems, 0 to 4 severity rating is associated as shown in Table 3.

Table 3: Severity Ratings and their Descriptions

Severity Rating	**Description**

0	I don’t agree that this is a usability problem at all.
1	Cosmetic problem only: need not be fixed unless extra time is available on project.
2	Minor usability problem: fixing this should be given low priority.
3	Major usability problem: important to fix, so should be given high priority.
4	Usability catastrophe: imperative to fix this before product can be released.

After conducting a detailed heuristic evaluation using the checklist of Usability Analysis and Design from Xerox Corporation (1995), a summary of heuristic problems are represented in Table 3.

Table 4: Summary of Heuristic Evaluation and Analysis

Data Collection and Analysis Form **Evaluator’s Name: Sarah Abd Al Lateef** **Session Date: 8/1/2025** **Session Start Time: 6 pm** **Session End Time: 8pm**			
Location	**Heuristic Violated**	**Description of the Problem**	**Severity Rating**
Login Page	**H1**	**Not every action comes with system feedback.**	**1**

Sidebar	**H2**	**I would have prepared view report to be first then download then print**	**2**
Selection	**H3**	**No option to use a pointing device or click on menu options**	**1**
Headings	**H7**	**The drop down menu area does not have a clear heading.**	**2**
Add Comments Page	**H7**	**The field does not indicate that it is optional**	**2**
Report Page	**H6**	**No error messages are displayed if the report fails to generate or save.**	**2**
Report Page	**H10**	**No help or documentation is provided for users who are**	**1**

		unfamiliar with the report generation process.	

Table 5: Summary of Heuristic Evaluation and Analysis 2

Data Collection and Analysis Form **Evaluator's Name: Raghad Saed Taha** **Session Date: 7/1/2025** **Session Start Time: 3 pm** **Session End Time: 5pm**			
Location	**Heuristic Violated**	**Description of the Problem**	**Severity Rating**
Login Page	H1	Response times were slow	1
Table	H1	Buttons in the table are clear but perhaps a different colour would attract more attention	1
Messages	H2	The wording of some messages could be rephrased	1
Data form	H2	In data entry screens terminology might not be familiar to all users	1
Menus	H3	Menus don't allow shortcuts	1
Log Out	H3	Log out does not ask for confirmation	2

Side bar functions	H4	Attention getting techniques	1
Menus	H4	Menu titles and name justification	1
Error messages	H5	Error messages could be clearer in indicating action to be taken	2
Error messages	H5	Error messages do not inform user of the severity of the error	1
Comments	H6	No indication of the maximum number of characters allowed	2
Optional fields	H7	Comments are not indicated as optional	2

Table 6: Summary of Heuristic Evaluation and Analysis **3**

Data Collection and Analysis Form **Evaluator's Name: Fadi Saadi** **Session Date: 6/1/2025** **Session Start Time: 4 pm** **Session End Time: 5pm**			
Location	**Heuristic Violated**	**Description of the Problem**	**Severity Rating**
Log out	H3	Users are not asked to confirm choice	2

Attention getting techniques	H4	Popup messages would be clearer if they were in a different color	2
Support for novice or experienced	H5	No difference in support between novice and experienced	2
Sound	H5	Sound is not used as a signal	1
Data entry	H6	No serious error warning is available	2
Comments	H7	The box and table do not indicate that comments are optional	1
Zone labels	H7	No label for drop down area	1
Data entry fields	H8	Not clear if option to click directly or use a keyboard is available	1

Based on the data gathered in Tables 4,5,6 , summary of violations by heuristics is shown in Table7, whereas summary of violations by severity rating is shown in Table 8.

Table 7: Summary of Violations by Heuristics

Heuristic Numbering Scheme	**Frequency**	**Ratio (%)**
H1 (Visibility of system status)	3	11.1%
H2 (Match between system and the real world)	3	11.1%
H3 (User control and freedom)	4	14.8%
H4 (Consistency and standards)	3	11.1%
H5 (Error prevention)	4	14.8%

H6 (Recognition rather than recall)	3	11.1%
H7 (Flexibility and efficiency of use)	5	18.5%
H8 (Aesthetic and minimalist design)	1	3.7%
H9 (Help users recognize, diagnose, and recover from errors)	0	0%
H10 (Help and documentation)	1	3.7%
Total:	27	100%

Table 8: Summary of Violations by Severity Rating

Severity Rating	Frequency	Ratio (%)
0	0	0%
1	15	55.6%
2	12	44.4%
3	0	0%
4	0	0%
Total:	27	100%

6.2 Cooperative evaluation

Monk et al. developed the co-operative evaluation technique in 1993. This approach is more than just user-centered, as it involves the user as an active participant in the evaluation process. Monk

et al. advocate that it be employed as part of an iterative prototyping process and not just at the end of a product development cycle, to determine whether the design is successful or not. Rather, this approach should be adopted so that the possibilities of negative results are minimized from the start through formative evaluation.

As they state, “Co-operative evaluation is a technique to improve a user interface specification by detecting the possible usability problems in an early prototype or partial simulation. It sets down procedures by which a designer can work with the sort of people who will ultimately use the software in their daily work, so that together they can identify potential problems and their solutions”.

Co-operative evaluation becomes distinctive because the collaboration occurs as users and designers evaluate the system together. Users are encouraged to ask the evaluator questions about interacting with the system and the evaluator asks them questions about their understanding of the system. This makes the procedure seems very natural to the users and requires fewer resources than more formal testing methods.

Evaluation is most useful for early feedback for redesign in a rapid iterative cycle. The aim is not to provide an exhaustive list of all the problems that could possibly be identified. Rather, it is to help designer identify the most important improvements to consider with the minimum of effort. Besides that it is cost effective in that it reveals important usability problems in a relatively short time.

For the purpose of conducting the co-operative evaluation, 6 participants were randomly selected based on their interest to participate in the evaluation process. Table 15 provides the participants details.

Table 9: Participants Details

No.	Criteria	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
1.	**Gender**	Male	Female	Male	Female	Male	Male
2.	**Age**	50	46	40	20	57	53
3.	**Educational Level**	Master	Phd	PhD	Bachelor	Master	Master's
4.	**Field**	Computer Science	Dentistry	Economy	Data Science	Law	Law

a) Pre-Evaluation Procedures

Participants were contacted through telephone conversations asking them the possibility to participate in the co-operative evaluation. A brief introduction to the system was given to the participants 10 minutes before they started the evaluation, and participants were asked to read that introductory document. The document also has a list of tasks, which will be performed by the participants throughout the co-operative evaluation. Users were told that they need to think aloud when facing any problem in the system. They were also told that, each task they perform is monitored and timed.

b) Evaluation Procedures

During the evaluation session, a moderator accompanied the users to do the co-operative evaluation. A comments form shown in Appendix A was used by the moderator to write down the comments of each user for each task. Users were helped when they really face serious

problems performing the tasks. The following tables show the comments form prepared by the moderator for each participant.

Table 10: Cooperative Evaluation for Participant No 1

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**
A.	**Log into the system**		
1.	Log in to the system Username: test Password:123456	25 seconds.	• Why does the password field hide characters?
2.	Log out	30 seconds	• The log out button is easy to find but I would prefer a confirmation prompt before log out
3.	Request verification code	2 minutes and 5 seconds	• The verification code process is clear, but it took a while to receive the code
4.	Reset password	55 seconds.	• Are there any requirements for the new password
B.	**Manage the data in the main table**		
1.	Select a program from the drop down menu	15 seconds.	• Is each choice based on the one before

2.	Accept or reject the proposed number	40 seconds	• The buttons make this easier
3.	View comments	24 seconds.	Adding who wrote the comment is really helpful
4.	Add comment	40 seconds	• The text box is better than writing in a column
C.	**Side bar**		
1.	Add the maximum capacity and the number of current students	2 minutes and 05 seconds.	• The form makes this easy
2.	View report	42 seconds	• I would prefer if I could chose what to include in the report
3	Print report	20 seconds	I like the print preview
4	Download report	42 seconds	The download is quick enough

Table 11: Cooperative Evaluation for Participant No 2

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**

A.	**Log into the system**		
1.	Log in to the system Username: test Password:123456	20 seconds.	• Are the letters case sensitive?
2.	Log out	28 second	• Is it this log out button in the side bar?
3.	Request verification code	2 minutes and 10 seconds	• Is it better to use mobile or email?
4.	Reset password	50 seconds.	• What do I click after I retype the passwords
B.	**Manage the data in the main table**		
1.	Select a program from the drop down menu	65 seconds.	• The user asked if they have to choose the drop down selection in order
2.	Accept or reject the proposed number	40 seconds	• The words make this easier
3.	View comments	24 seconds.	Can I edit the comments?
4.	Add comment	1 minute and 10 seconds	• Is there a word limit ?
C.	**Side bar**		

1.	Add the maximum capacity and the number of current students	3min 15 s	• What do I fill the final decision with?
2.	View report	27 seconds	• Is it this view button in the side bar • The icon design is really fitting
3	Print report	17 seconds	• Do I just click the print in the side bar?
4	Download report	39 seconds	What format is the downloaded file?

Table 12: Cooperative Evaluation for Participant No 3

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**
A.	**Log into the system**		
1.	Log in to the system Username: test Password:123456	30 seconds.	• the password field should have a show/hide option

2.	Log out	35 seconds	• The logout button is easy to find, but it should have a confirmation message
3.	Request verification code	1 minutes and 20 seconds	• The code should be sent faster
4.	Reset password	1 min 5 s	• Why isn't there a strength meter
B.	**Manage the data in the main table**		
1.	Select a program from the drop down menu	35 seconds.	• Is there a clear choices button?
2.	Accept or reject the proposed number	30 seconds	• I am glad there is a comment to justify my choice
3.	View comments	44 seconds.	Can I reply to comments?
4.	Add comment	1 minute and 20 seconds	• Does the box auto expand ?
C.	**Side bar**		
1.	Add the maximum capacity and the number of current students	2 minutes and 4 s	• This is easy
2.	View report	35 seconds	• Can I customize the report

3	Print report	22 seconds	• This triggers the print function quickly
4	Download report	45 seconds	Can I change the save location

Table 13: **Cooperative Evaluation for Participant No 4**

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**
A.	**Log into the system**		
1.	Log in to the system Username: test Password:123456	66 seconds.	• I find blurry backgrounds annoying
2.	Log out	69 seconds	• I like the clear log out button, no hiding in a long list in a profile
3.	Request verification code	3 minutes and 28 seconds	• Is there good internet coverage here? That delays these things usually
4.	Reset password	87 s	• Thinking of a new password is always hard
B.	**Manage the data in the main table**		
1.	Select a program from the drop down menu	56 seconds.	• Are all these programs available in the university of Jordan

2.	Accept or reject the proposed number	57 seconds	• That is easier than writing
3.	View comments	25 seconds.	Can I reply to comments?
4.	Add comment	49 s	• Does the box auto expand ?
C.	**Side bar**		
1.	Add the maximum capacity and the number of current students	2 minutes and 48 s	• Can you automate the data entering process?
2.	View report	25 seconds	• Can I customize the report
3	Print report	38 seconds	• This triggers the print function quickly
4	Download report	16 seconds	Can I change the save location

Table14: **Cooperative Evaluation for Participant No 5**

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**
A.	**Log into the system**		

1.	Log in to the system Username: test Password:123456	30 seconds.	• the password field should have a show/hide option
2.	Log out	35 seconds	• The logout button is easy to find, but it should have a confirmation message
3.	Request verification code	1 minutes and 20 seconds	• The code should be sent faster
4.	Reset password	1 min 5 s	• Why isn't there a strength meter
B.	**Manage the data in the main table**		
1.	Select a program from the drop down menu	35 seconds.	• Is there a clear choices button?
2.	Accept or reject the proposed number	30 seconds	• I am glad there is a comment to justify my choice
3.	View comments	44 seconds.	Can I reply to comments?
4.	Add comment	1 minute and 20 seconds	• Does the box auto expand ?
C.	**Side bar**		
1.	Add the maximum capacity and the	2 minutes and 4 s	• This is easy

	number of current students		
2.	View report	35 seconds	• Can I customize the report
3	Print report	22 seconds	• This triggers the print function quickly
4	Download report	45 seconds	Can I change the save location

Table 15 Cooperative Evaluation for Participant No 6

Task No.	**Test**	**Time Taken to Complete the Task**	**Comments**
A.	**Log into the system**		
1.	Log in to the system Username: test Password:123456	39 seconds.	I like the picture in the background
2.	Log out	38 seconds	I think the black makes it clearer
3.	Request verification code	3 minutes and 28 seconds	• These always take time
4.	Reset password	1 min 25 s	• Can I use numbers only
B.	**Manage the data in the main table**		

1.	Select a program from the drop down menu	45 seconds.	• Some departments offer more than one program?
2.	Accept or reject the proposed number	39 seconds	• You should make the reject red in color
3.	View comments	44 seconds.	It looks like a mini chat
4.	Add comment	1 minute and 29 seconds	• I would rather if it was in the table
C.	**Side bar**		
1.	Add the maximum capacity and the number of current students	2 minutes and 4 s	• This is easy
2.	View report	38 seconds	• Can I customize the report
3	Print report	67 seconds	• I get a preview too
4	Download report	49 seconds	Can I change the save location

It is important to compare the time taken by each participant to complete each single task compared to the default time allocated by the moderator as shown in Table 9

Table 16: Task Completion Times in Minutes and Seconds

Task No.	Default	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
A. log in							
1.	24 s	25 seconds.	20 seconds.	30 seconds.	66 seconds.	30 seconds.	39 seconds.
2.	28s	30 seconds	28 second	35 seconds	69 seconds	35 seconds	40 seconds
3.	1 min 10 s	2 minutes and 5 seconds	2 minutes and 10 seconds	1 minutes and 20 seconds	3 minutes and 28 seconds	1 minutes and 20 seconds	3 minutes and 28 seconds
4.	30 s	55 seconds.	50 seconds.	1 min 5 s	87 s	1 min 5 s	1 min 25 s
B. Manage the data							
1.	15 s	15 seconds.	65 seconds.	35 seconds.	56 seconds.	35 seconds.	45 seconds.
2.	30 s	40 seconds	40 seconds	30 seconds	57 seconds	30 seconds	39 seconds
3.	20 s	24 seconds.	24 seconds.	44 seconds.	25 seconds.	44 seconds.	44 seconds.

4	38s	40 seconds	1 minute and 10 seconds	35 seconds.	49 s	1 minute and 20 seconds	1 minute and 29 seconds
C. Side bar							
1.	2 min 2 s	2 minutes and 05 seconds.	3 min 15 s	2 minutes and 4 s	2 minutes and 48 s	2 minutes and 4 s	3 minutes and 4 s
2.	20 s	42 seconds	27 seconds	35 seconds	25 seconds	35 seconds	38 seconds
3.	17 s	20 seconds	17 seconds	22 seconds	38 seconds	22 seconds	67 seconds
4.	33 s	42 seconds	39 seconds	45 seconds	46 seconds	45 seconds	49 seconds
Total Completion Time	**447**	**771**	**725**	**550**	**834**	**625**	**927**

c) Post-Evaluation Procedures

After completing the co-operative evaluation, participants were given a post-test questionnaire to fill in, which is shown in Appendix B. This questionnaire was important to capture their thoughts and feelings about the system while they were still fresh. The questionnaire was then followed by a short interview and discussion, which mainly focused on the initial modified

design of the system. Table 17 shows the responses of the 6 participants to the post-test questionnaire.

Table 17: Participants Responses to the Post-Test Questionnaire

No.	Statement	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Average
1	The system is easy to use.	4	4	5	4	4	5	**4.5**
2	The system has accomplished its goals.	4	5	4	4	4	5	**4.5**
3	The system interface is interactive.	5	5	4	5	5	4	**4.33**
4	The log in is easy to understand and easy to follow.	5	5	4	5	5	5	**4.66**
5	It is easy to understand the functionality of the system without prior experience.	4	4	4	5	4	5	**4**
6	The side bar is clear and easy to understand and use	5	5	5	4	5	5	**4.3**
7	The concept of the system was difficult to understand.	2	2	2	3	2	2	**2.3**

8	I liked the look and feel of the system	4	5	4	5	4	5	**4.5**
9	I felt that the tasks were difficult to complete using the system	2	2	2	2	2	2	**2**
Average		**3.88**	**4.11**	**3.78**	**4.11**	**3.89**	**4.22**	**4**

7.0 Conclusion and future work

7.1 Overall Weaknesses

1. No FAQ section for guiding new users

2. No auto-save functionality: Users need to manually save

3. no support for other languages

7.1 Overall strengths

Responsive Design: The system's design is responsive and works well .

Clean and minimalistic design ensures ease of navigation

Streamlined Processes: Users appreciated the streamlined process

Role based access ensures security and clarity

User-Friendly Interface: The interface is generally intuitive, with clear labels and navigation options. Dropdown menus and structured input forms enhance usability.

7.2 Future Work

Add Help Documentation: Provide a help section or documentation to assist users who are unfamiliar with the system.

Optimize Performance: Improve the system's performance, especially when handling large datasets or multiple users simultaneously.

Expand Features: Add more features, such as exporting data in different formats, and customizable reports.

8. 0 References

Material classes and slides