

HW 1

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1. Stakeholders

a)

1. Studierende

Die Studierenden haben ein großes Interesse am Projekt, da es ein wichtiger Teil ihrer Studienleben wird. Sie werden täglich die Plattform benutzen.

2. Lehrende

Für die Lehrenden ist das Projekt auch von großer Bedeutung, da es eine einheitliche Plattform für Kommunikation mit Studierenden wird und sehr aktiv im Lernprozess eingesetzt wird.

3. Universitätsverwaltung

Die Universitätsverwaltung teilt über Klipsias, welche Kurse in diesem Semester angeboten werden und alle relevanten Informationen darüber. Sie werden eventuell Klipsias nicht so aktiv wie Studierende und Lehrende benutzen, sondern hauptsächlich vor dem Semesteranfang. Die Plattform sollte für die Verwaltung auch Daten zur Analyse bereitstellen (welche Kurse beliebt sind, für welche Räume die größte Nachfrage ist (Raumbuchungssystem)).

4. Entwickler (Programmierer)

Interesse am Aufbau und der technischen Umsetzung der Plattform, klare Anforderungen, Ressourcen und technische Unterstützung zur erfolgreichen Entwicklung.

5. Andere Universitäten

Wenn das Projekt an der Uni Köln erfolgreich wird, können andere Universitäten auch gleiche Plattformen entwickeln. Andere Universitäten sind aber eher Beobachter.

6. IT-Support der Universität

IT-Support soll wissen, wie die Lernplattform technisch gestaltet ist, um diese warten zu können.

b)

Power

Universitätsverwaltung IT-Support der Universität	Studierende Lehrende
Andere Universitäten	Entwickler (Programmierer)

Interest

2. Requirements

a) 6 functional requirements

1. **Exercise Group Creation:** Lecturers must be able to create exercise groups for their courses, specifying details like session times and the maximum number of students each group can handle.
2. **Student Session Viewing:** Students must be able to log in to view available exercise sessions for the courses they are registered in.
3. **Schedule Conflict Marking:** Students should be able to mark time slots when they are unavailable due to other obligations, so the system can consider their schedules during group assignments.
4. **Automatic Group Assignment:** The system must automatically assign students to groups in a way that minimizes scheduling conflicts and ensures fair distribution based on availability.
5. **Notification of Group Assignment:** The system should notify students about the groups they have been assigned to once the distribution is completed.
6. **Manual Assignment Option:** If a student cannot be automatically assigned to a group, the system must allow for manual intervention by an administrator to assign that student to a group.

b) 3 quality requirements and their respective quality attribute

a. Security Requirement

i. Attribute: Data Privacy and Confidentiality

ii. Description: Security will be a priority, with access controlled through university credentials (Shibboleth) and personal data protected from unauthorized access.

b. Scalability Requirement

i. Attribute: Concurrent Users

ii. Description: The system shall support a minimum of 1000 concurrent users without a significant decrease in performance.

c. Usability Requirement

i. Attribute: User Interface Clarity

ii. Description: The user interface shall be designed with clear navigation and intuitive controls to ensure ease of use.

c) 1 constraint

Technology Stack Constraint

Description: The system development shall use the existing technology stack of the University's IT infrastructure to minimize additional software and hardware costs.

d) 1 project requirement

Budget:

The total budget allocated for the development of the system is €70,000.

e) 1 process requirement

Student Involvement:

Students must participate in the system's development as both developers and testers, allowing them to contribute to the process and provide feedback.

3. Requirements Validation

Requirement	Criteria Met	Explanation	Improvement Suggestion
Exercise Group Creation	Precision: Yes	Requirement is precise, consistent with other system functions, and verifiable through testing. It aligns with the system's purpose of facilitating group management.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Student Session Viewing	Precision: Yes	Clear, supports students in selecting sessions and is testable. Fits well with other requirements.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Schedule Conflict Marking	Precision: Yes	Requirement is specific and supports fair group assignment. It can be tested by checking if marked time slots affect assignments correctly.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Automatic Group Assignment	Precision: Partially	Lacks precision on assignment logic (e.g., priority order) and verifiability on fairness measurement.	Define assignment logic more explicitly, such as prioritizing by student availability or random distribution if conflicts are minimal.
	Consistency: Yes		
	Verifiability: Partially		
	Validity: Yes		

Requirement	Criteria Met	Explanation	Improvement Suggestion
Notification of Group Assignment	Precision: Yes	Requirement is specific and ensures students are informed of assignments, which supports user engagement and satisfaction.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Manual Assignment Option	Precision: Partially	Precision and verifiability could be improved by specifying who has authority for manual adjustments and under what conditions.	Specify who (e.g., system admin) will perform manual assignments and under what conditions (e.g., remaining unassigned students after automated process).
	Consistency: Yes		
	Verifiability: Partially		
	Validity: Yes		
Security Requirement	Precision: Yes	Requirement clearly defines access control and data privacy, which are verifiable through security audits and testing.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Scalability Requirement	Precision: Yes	Specifies clear performance metric (1000 users) and is consistent with potential future use. Can be verified via load testing.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Usability Requirement	Precision: Partially	Lacks precise usability metrics (e.g., time on task, user satisfaction), which limits verifiability. Consistent with goal of a user-friendly system.	Define specific usability metrics (e.g., average user task completion time, satisfaction rate in user testing) for better precision and verifiability.
	Consistency: Yes		
	Verifiability: Partially		
	Validity: Yes		
Technology Stack Constraint	Precision: Yes	Clear in specifying reliance on existing infrastructure and verifiable by comparing it to the university's technology stack.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		

Requirement	Criteria Met	Explanation	Improvement Suggestion
Budget Requirement	Precision: Yes	Specifies an exact budget and is relevant to project feasibility. Verifiable through cost tracking.	N/A
	Consistency: Yes		
	Verifiability: Yes		
	Validity: Yes		
Student Involvement Process Requirement	Precision: Partially	Precision and verifiability could improve by specifying participation details (e.g., roles, testing phases). Consistent with project's educational goals.	Define participation specifics, such as roles in development/testing and expected contribution levels, to improve clarity and verifiability.
	Consistency: Yes		
	Verifiability: Partially		
	Validity: Yes		

4. Use Case

Register for Exercise Groups and Resolve Scheduling Conflicts

Actors:

- **Primary Actor:** Student
- **Supporting Actors:** Lecturer, Course Coordinator

Preconditions:

- The student is enrolled in one or more courses with exercise groups.
- The student has university credentials to access the EGD system.

Main Success Scenario:

1. **Student Login:** The student logs into the EGD system using university credentials.
2. **Course and Group Viewing:** The system displays all enrolled courses and the available exercise groups (or lab sessions) for each course.
3. **Availability Input:** The student enters times when they are unavailable due to other obligations, such as other classes or personal commitments.
4. **Automatic Group Assignment:** Based on the student's availability and the session times for each course, the EGD system attempts to assign the student to appropriate exercise groups.
5. **Confirmation of Assignment:** If all course assignments are successful without conflicts, the student receives a confirmation of assigned exercise groups for each course.
 - **System Response:** A notification (such as an email) is sent to the student with a summary of assigned groups.

Alternative Scenarios (Extensions):

- **4a. Partial Assignment with Scheduling Conflicts:**
 - 4a1. The EGD system identifies that one or more course groups cannot be assigned without conflicts.
 - 4a2. The system notifies the student of unassigned courses due to scheduling conflicts.
 - 4a3. The student receives information on the unassigned groups and is encouraged to contact the course lecturer or coordinator for manual adjustment if needed.
- **4b. No Available Group for One or More Courses:**
 - 4b1. If no group slots are available for a specific course, the system notifies the student of the lack of available sessions.
 - 4b2. The system recommends that the student contacts the relevant course coordinator to arrange an alternative solution.

Postconditions:

- The student is either assigned to all requested exercise groups without conflicts or has been notified of unresolved conflicts.
- If applicable, manual adjustments have been made in coordination with the lecturers to resolve scheduling issues.

Exceptions:

- **Login Failure:** The student cannot log into the system due to incorrect credentials or technical issues (handled outside of this use case).
- **System Error:** The system fails to assign groups or display availability due to a technical issue, requiring assistance from system admins.

Frequency of Use: Typically at the start of each semester, during course registration periods.