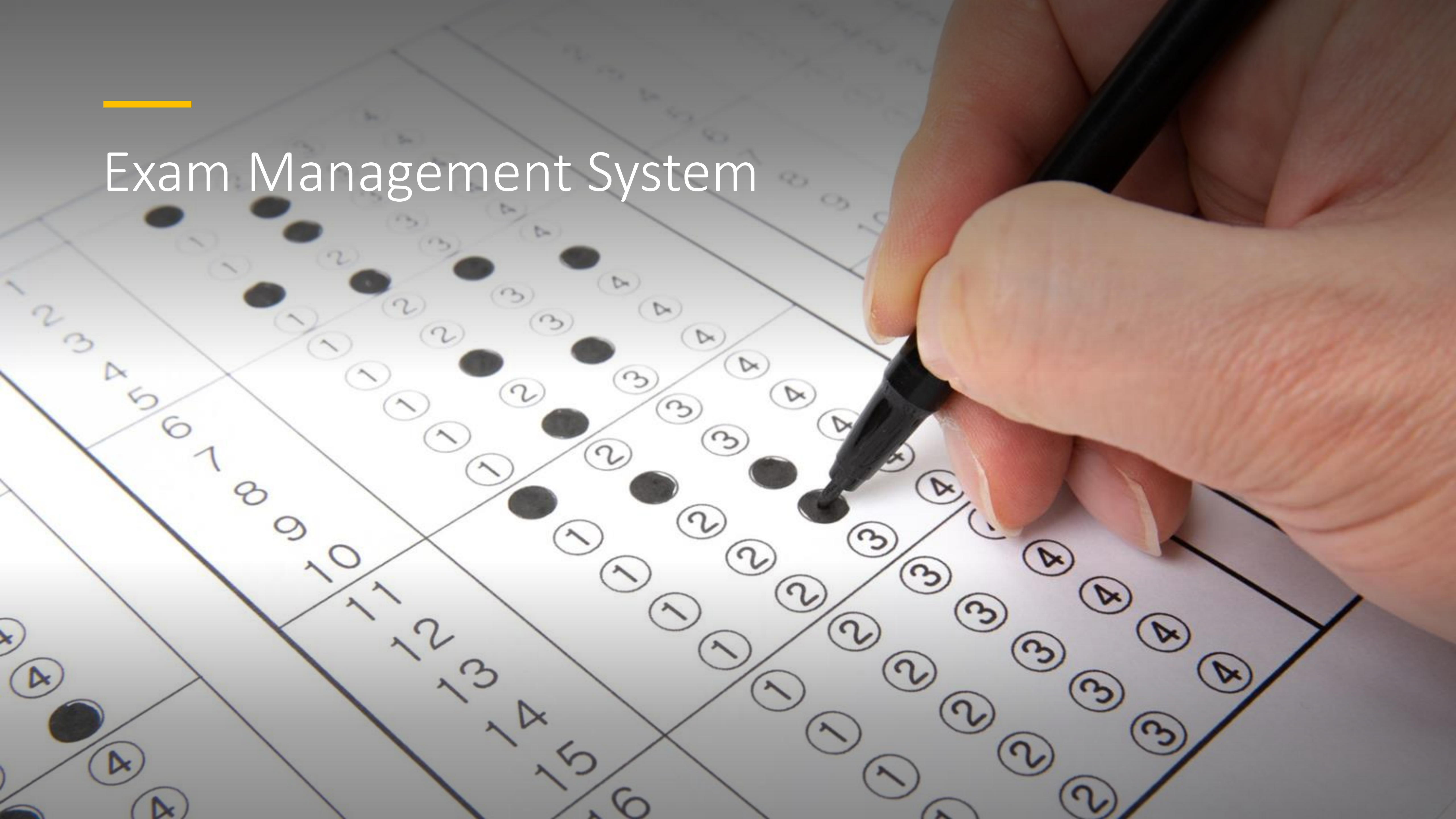
Exam Management System



Our system manage work inside of an academic course between the lecturer(s) and the TAs. Through the system you will develop, test and create multiple-choice questions, generate exams and analyze them

Project’s Motivation and Purpose

- General Problem:
  - With the increase in the size of the student body, it has become difficult to manage grading within the given time constraints. This has led many courses to adopt a multiple-choice format, which is faster to grade, and easier to analyze.
  - The creation of challenging multiple-choice tests in the sciences is a non-trivial task.
  - The creation of one-time-use questions is costly and unsustainable.
- Specific Problem:
  - Maintenance of a large and growing pool of questions is proving to be difficult.
  - Current implemented system is local, inaccessible and hard to learn.
  - Division of labor between TAs and test examiners is done by hand and is hard to track.
  - The possibility of tracking quality of questions & answers is crucially needed.
- What is the solution?
  - A web-based System for managing work, subjects, questions.
  - Intended to replace current offline system.

Project’s Steps and Timeline

User Interface:

Web-based

Login page

Role dependent dashboard + actions

Workflow Management:

Ask for work

Watch pending tasks

Perform specific task

Maintain history (continue where left off)

Manual urgency control

Automatic/Algorithmic urgency control

Exam Management:

Meta-question management

Appendices management (appendices + their meta questions)

Stem management (stems + their appendices + their meta questions)

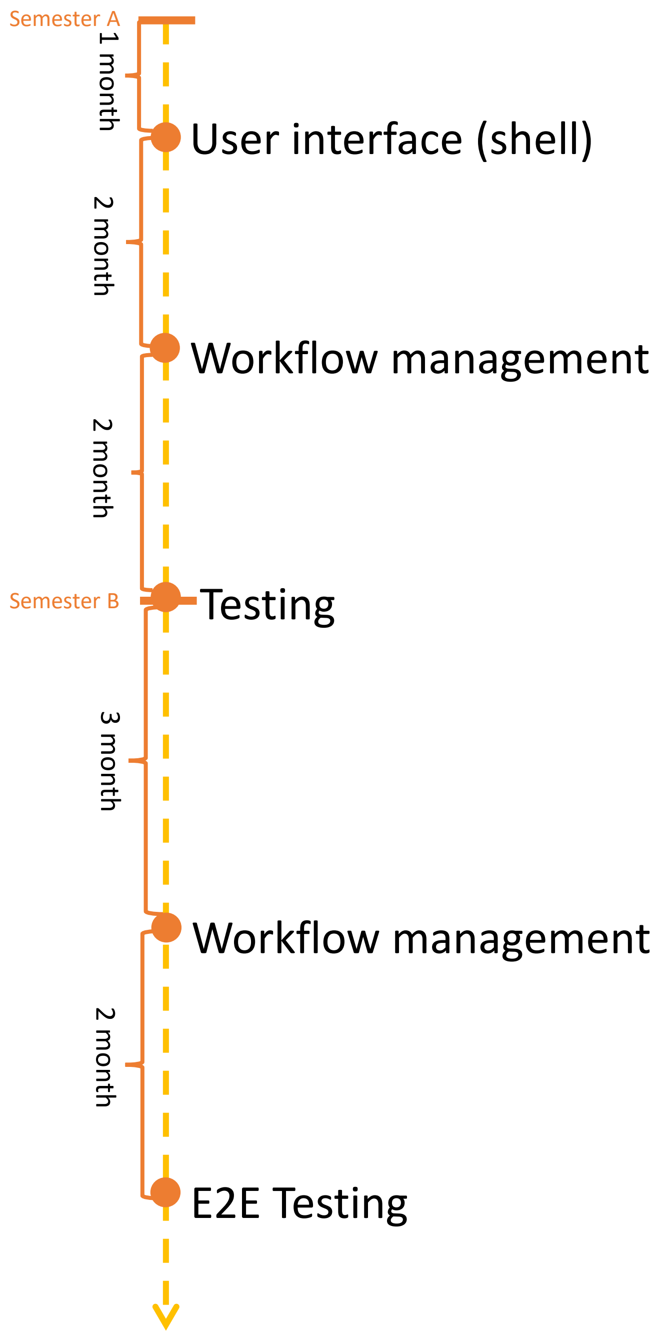
Selection of meta-questions by keywords/substring

Question production

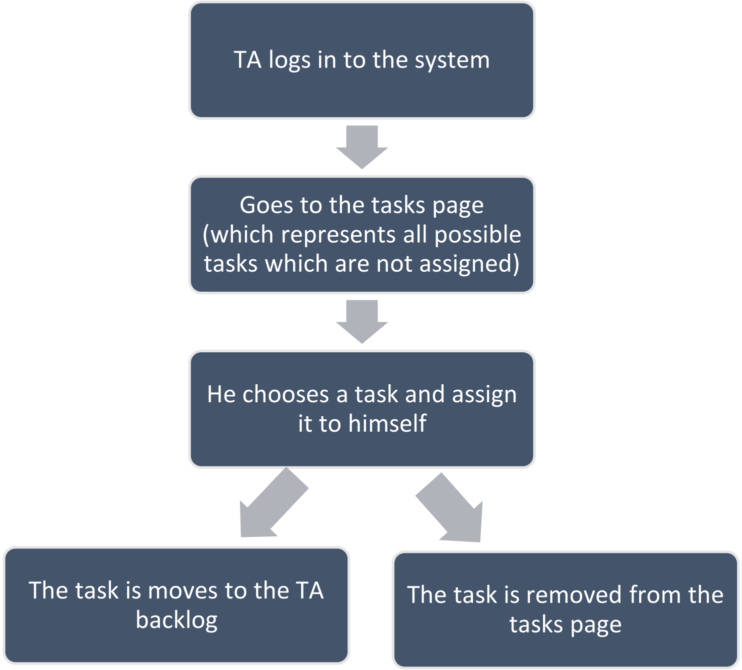
Exam production

Catalog production

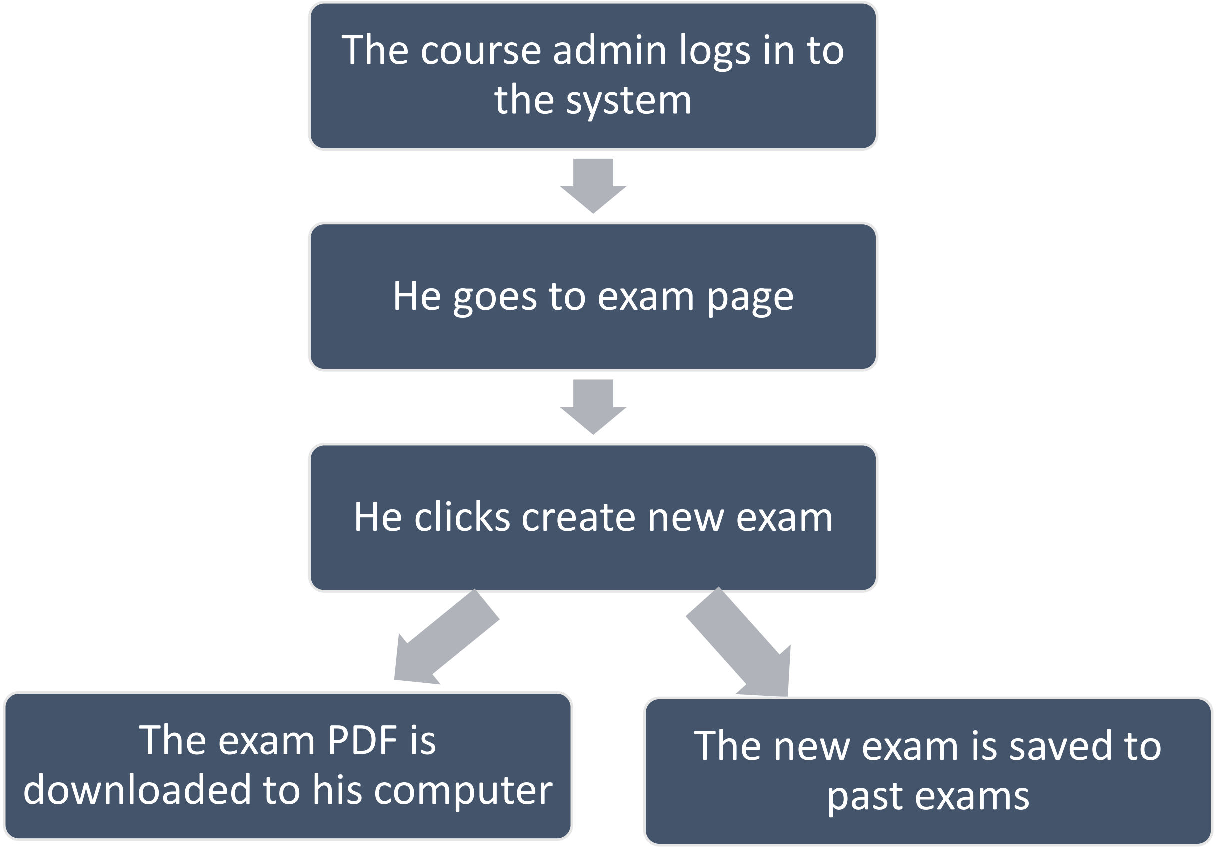
Version Control



Work management flow :
TA takes a task from the task pool


TA logs in to the system
Goes to the tasks page (which represents all possible tasks which are not assigned)
He chooses a task and assign it to himself
The task is moves to the TA backlog
The task is removed from the tasks page

Create exam



The course admin logs in to the system

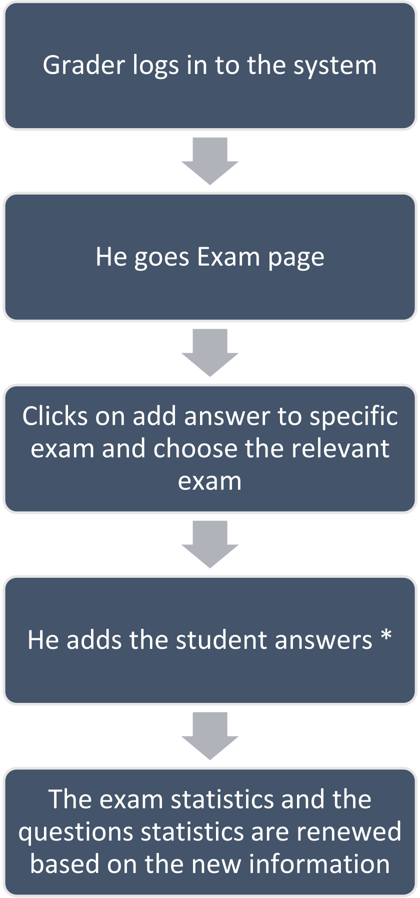
He goes to exam page

He clicks create new exam

The exam PDF is downloaded to his computer

The new exam is saved to past exams

Add exam answers



Grader logs in to the system

He goes Exam page

Clicks on add answer to specific exam and choose the relevant exam

He adds the student answers *

The exam statistics and the questions statistics are renewed based on the new information

* In the future we might want to change It into scanned answers

Technological choices

Backend:	**JavaScript**
Frontend:	**React**
Database:	**Postgress**

Risks

User Adoption Challenges:

Example: Resistance from users to adapt to the new system.

Mitigation: Provide user documentation, and gather feedback early in the development process.

Data Security:

Example: Vulnerability to unauthorized access and leaking of sensitive information.

Mitigation: Use user authentication mechanisms to safeguard sensitive data, access will be allowed only from the university network, or by using vpn.

Web Interface:

None of the members had work as a web developmet

Mitigation: All members will read and study about prepared libraries (specifically risk) that will allow easy web interface development

Proof Of Concept

Research:

- **Examination of Web-Based Workflow Tools:**
  - Investigate popular web-based workflow management tools.
  - Assess their capabilities for role-based dashboards and task distribution.
- **Algorithmic Task Distribution:**
- Research and develop a preliminary algorithm for task distribution

Preliminary:

- **Selection of Web-Based Framework:**
  - Based on research, choose a web-based framework suitable for developing the workflow management system.
- **Basic UI Development:**
  - Implement basic UI features, such as role-based dashboards and content organization.
  - Integrate a simple manual task assignment mechanism.

System Implementation:

1.Workflow management:

- Implement a simplified version of the workflow management system

2.LaTeX-Based Exam Creation and analysis :

- Develop a module for flexible LaTeX-based exam, key, and solution creation.

3.Database Integration:

- Establish basic database integration for handling workflow and content data.

Where are we now?

1. Started learning JS and react
2. We have agreed on the design of the backend
3. We created a preliminary server with just a login option