Exam Management System

ARD

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# Chapter 1 – Introduction

## The Problem Domain

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 analyse. And still, the creation of challenging multiple-choice tests in the sciences is a non-trivial task and creation of one-time-use questions is costly and unsustainable.

While trying to come up with a system of his own, Dr. Goldberg found that maintenance of a large and growing pool of questions is proving to be difficult. Division of labor between TAs and test examiners is done by hand and is hard to track and the possibility of tracking quality of questions & answers is crucially needed.

## Context

The system is designed to manage work inside of an academic course between the lecturer(s) and the TAs.   
Through the system will the course administration develop, test and create multiple-choice questions and generate exams.   
The system will be installed remotely on university’s servers and be accessed through web applications, while the data will be stored on databases.

## Vision

* Workflow Management System:
  + Support various roles (for TAs, graders, instructors, etc).
  + Manual+Algorithmical generation of tasks based on priority and needs.
  + Manual+Algorithmical spread of tasks throughout configured workforce.
  + Tracking over work velocity and output (= blame feature).
* UI:
  + Web-based system.
  + Dashboard based on Role.
* Content creation:
  + Manage content by subjects/keywords/classes.
  + Creation and management of stems, meta-questions, questions, appendices.
  + Creation and management of possible solutions/distractors per question.
* Output creation:
  + Flexible LaTeX-based creation of exams/keys/solutions.
* System:
  + Have both WMS and content handled in DB.
  + Version control of questions, handled in DB.
  + Easy install, migration, backup and cloning of the system.

## Stakeholders

Client: Dr. Mayer Goldberg – Supervisor Lecturer for “Compiler Construction” course.   
Users: “Compiler Construction” course administration – lecturers, TAs, assignment checkers.   
Additional people of interest: Other courses’ supervisors are interested in the system when it comes to existence.

## Software Context

### Access

Access to the system will be through browsers and only while connected to the university’s network.

### Regular Use (Course downtime)

Users will access the system to maintain question stock based through various tasks completion based on their respective roles.   
High roles will be able to track work velocity and quality of lower-level roles.

### Pre-Exam

High roles will be able to produce exams/keys/solutions through the system and by choosing subjects distribution.

### Post-Exam

Inputting students answers will be used to further analyze questions/answers/distractors quality.