Acme Work-Pad

Acme, Inc. is a holding that encompasses many companies worldwide. One of them is Acme Work-Pad, Inc., which provisions schools worldwide with a system to manage their subjects.

The goal of this project is to develop a web information system that Acme Work-Pad, Inc. can use to run their business. This document provides an informal description of their requirements; ask your lecturers for clarifications and details.

C-level requirements

Information requirements

1. The actors of the system are administrators, teachers, and students. The system must store their names, surnames, and email addresses; optionally, it might also store a phone number and a postal address.
2. The system must store information about the subjects in a school. For every subject it must store a title, a ticker, a syllabus, the number of seats available, and the instructor who lectures it. Tickers are codes of the form "^\w{2}-\d{5}$" which identify subjects uniquely. The instructor is a teacher who must be registered to the system. The system must keep track of the administrator who registers every subject. Every subject has bulletins, activities, assignments, and groups.
3. A bulletin is a note that any actor can post to a subject. For every bulletin, the system must store a title, the moment when it's posted, and a piece of text.
4. An activity is something that is done in a subject so as to achieve its goals, e.g., theory lectures, laboratory lectures, control checks, and so on. For every activity, the system must store a title, a description, a start date, an end date, and an optional link to further information.
5. Every subject belongs to a category, which may, in turn belong to another category. There's a predefined root category called "ACTIVITY" that doesn't belong to any other category. Categories are thus organised into a tree.
6. Assignments are small projects for which the system must store a title, a description, a start date, an end date, and an optional link to further information.
7. Students work in groups to prepare their assignments. For each group, the system must store a name and a description plus a period of time during which students can join it.
8. A group of students may submit a deliverable to any of the assignments that correspond to the subject to which that group belongs. For every submission, the system must store its contents in plain text and some optional attachments. A group may submit as many deliverables as they wish as long as the corresponding assignment is not over. The system must assign a consecutive attempt number to every submission. Teachers grade the submissions with a number of points in range 0 – 100. The system computes the corresponding mark automatically.
9. Actors may exchange messages, which they can store in custom folders. For every message the system must store the moment when it is sent, a subject, a body, and a priority, which can be either "HIGH", "NEUTRAL", or "LOW". Folders may be organised into folder trees. The system provides several pre-defined folders for every actor, namely: inbox, outbox, trashbox, and spambox. When an actor removes a message from a folder other than the trashbox, it is moved to folder trashbox; when an actor removes a message from the trashbox folder, it is then removed from the system. The system flags a message as spam if it

contains any of the key words that an administrator has configured; by default, the key words must include, but must not be limited to, “viagra”, “cialis", “jes extender”, and “sex”. Actors can create their custom folders and manage them. For every message, the system must keep track of the sender, the recipient, the moment when it was sent, the subject, the body, and its priority. Priorities are HIGH, NEUTRAL, or LOW; no other values are expected.

Functional requirements

10. An actor who is not authenticated must be able to:
    1. Register to the system as a student.
    2. Browse the list of subjects and navigate to their teachers.
    3. Browse the list of teachers and navigate to the subjects that they teach.
    4. Search for subjects that contain a single key word in their title or description; the actor must be able to choose whether he or she wishes the system not to list subjects for which there are no seats available.
11. An actor who is authenticated must be able to:
    1. Do the same as an actor who is not authenticated, but register to the system.
    2. Edit his or her personal data.
    3. Publish bulletins regarding any subject.
    4. Exchange messages with other actors of the system.
12. An actor who is authenticated as a teacher must be able to:
    1. Manage the activities involved in a subject that he or she teaches, which includes listing, creating, editing, and deleting them.
    2. Manage the assignments involved in a subject that he or she teaches, which includes listing, creating, editing, and deleting them. They can also grade the submissions that groups of students have made regarding an assignment. (Note that the mark of an assignment must be computed automatically building on the grade).
13. An actor who is authenticated as a student must be able to:
    1. Enrol a subject as long as there are any seats available.
    2. Create a new student group in any of the subjects that he or she’s enrolled.
    3. Join an existing group in a subject that he or she’s enrolled, as long as he or she hasn’t joined any other groups in that subject and the current time is within the period of time in which it’s allowed to join the group.
    4. Submit a deliverable to an assignment as many times as he or she needs as long as the assignment is active, that is, the current date is between its start and end dates.
14. An actor who is authenticated as an administrator must be able to:
    1. Manage a subject, which includes listing, displaying, editing, and deleting it. Note that only the manager who registers a subject can edit or delete it.
    2. Register a teacher to the system so that he or she can log in and use the system.
    3. Associate a teacher with the subjects that he or she has to teach.
    4. Display a dashboard with the following information:
        - The teacher who teaches more subjects.
        - The teacher who teaches fewer subjects.
        - The teachers who teach the average number of subjects plus minus 10%.
        - The minimum, the maximum, and the average number of subjects taught by the teachers.
        - The minimum, the maximum, and the average number of seats offered per subject.
        - The minimum, the maximum, and the average number of students who have enrolled a subject.
        - The minimum, the maximum, and the average number of assignments per subject.

Non-functional requirements

15. The system must be available in English and Spanish. (The data themselves are not required to be available in several languages, only the messages that the system displays.)
16. The system will be run in Spain, so it must comply with the Spanish regulations except for the following ones: a) the requirement in LOPD regarding keeping files and communications secure and confidential (unless you opt to earn an A+, in which case you're requested to use the HTTPS protocol where appropriate); b) the requirement in LSSI regarding informing the Chamber of Commerce about your internet domain.
17. The system must be as efficient and difficult to hack as possible (including GET, POST, XSS, and SQL hacking).
18. Phone numbers should adhere to the following pattern: "+CC (AC) TN", where CC is a two digit country code, "(AC)" is an optional area code that consists of up to three digits, and "TN" is a telephone number that consists of at least 4 digits. Whenever a phone number that does not match this pattern is entered, the system must ask for confirmation; if the user confirms the number, it then must be stored.
19. Attachments themselves are not stored in the system, but links to external storage services like consigna.us.es or dropbox.com.
20. The system must be configured so that it can be deployed to a variety of schools. It must be very easy to customise the system with the name and the banner of the school to which it's going to be deployed. By default, it must be configured with a school called "Acme School" whose banner's available at http://www.ghsd75.ca/images/template/s-acme.png.
21. Unauthenticated actors are not allowed to see the bulletins, the activities, the assignments or the groups in a subject.

B-level requirements

Information requirements

22. Every actor has an associated activity report, which consists of activity records. For every such record, the system must store the moment when it's written, a description, and some optional attachments.
23. Teachers may organise seminars that every student can attend. For every seminar, the system must store a title, an abstract, the moment when it's going to be organised, the duration in hours, the hall where it'll be held, and the number of seats available.

Functional requirements

24. An actor who is authenticated must be able to:
    1. Display the activity record of every actor whose profile he or she can display.
    2. Manage his or her activity records, which includes listing, creating, editing, and deleting them.
25. An actor who is authenticated as a teacher must be able to:
    1. Manage his or her seminars, which includes listing, creating, editing, and deleting them.
26. An actor who is authenticated as a student must be able to:
    2. Register to a seminar.
    3. Unregister from a seminar.
27. An actor who is authenticated as an administrator must be able to:
    4. Display a dashboard with the following information:

- The minimum, the maximum, and the average number of activity records per actor.
- The actors who have ±10% the average number of activity records per actor.
- The minimum, the maximum, and the average number of seminars per teacher.
- The teachers who organise ±10% the average number of seminars per teacher.

Non-functional requirements

28. The system creates activity records automatically every time that: an actor posts a bulletin; an administrator creates, edits, or deletes a subject; a teacher creates, edits, or deletes an activity; a teacher creates, edits, or deletes an assignment; a teacher creates, edits, or deletes a seminar; a student enrols a subject; a student submits an assignment; a student registers to a seminar.
29. The activity records created by the system must be written in both English and Spanish.

A-level requirements

Information requirements

30. Teachers may associate bibliography records with the subjects that they manage. For every such record, the system must store a title, the authors, and a locator. The locator is a piece of text that uniquely identifies a piece of bibliography, e.g., an ISBN or a DOI.
31. The actors of the system may register their social identities. For every such identity, the system must store a nick, the name of a social network, a link to his or her profile, and an optional photo.

Functional requirements

32. An actor who is authenticated must be able to:
    1. Manage his or her social identities, which includes listing, creating, editing, and deleting them.
33. An actor who is authenticated as a teacher must be able to:
    1. Manage bibliography records, which includes listing, creating, editing, and deleting them.
34. An actor who is authenticated as an administrator must be able to:
    1. Display a dashboard with the following information:
        a. The minimum, the maximum, the average, and the standard deviation of bibliography records per subject.
        b. The ratio of subjects that have only one or two bibliography records.
        c. The minimum, the maximum, the average, and the standard deviation of social identities per actor.
        d. The ratio of actors that have at least one social identity.

Non-functional requirements

Intentionally blank.

A+-level requirements

Information requirements

Intentionally blank.

Functional requirements

Intentionally blank.

Non-functional requirements

35. The communications must be secured by using HTTPS where appropriate. A short report to explain how this A+ has been implemented is required.
36. At least a repository must be paginated and used in a listing. The students are requested to use Spring's technology to implement such repositories. They must also produce a short report in which they explain how this A+ has been implemented.