Acme Library

Information requirements

1. The actors of the system are administrators, readers, organizers and sponsors. For every actor, the system must store a name, an optional middle name, a surname, an optional photo, an email, a phone number, and an address.

2. The actors can also have social profiles. The system must store the following data regarding such profiles: a nick, the name of the social network, a link to a profile in that social network.

3. Actors can exchange messages. For every message, the system must keep track of the sender, the recipient, the moment when it was sent, the subject, the body, its priority, and some optional tags. Priorities are HIGH, NEUTRAL, or LOW; no other values are expected. Every actor has the following message boxes: in box, out box, trash box, spam box and notification box. When an actor receives a message, it gets to the in box unless the system flags it as spam, in which case it gets to the spam box. When he or she sends a message to another user, it's saved to the out box. When an actor removes a message from a box other than trash box, it is moved to the trash box; when he or she removes it from the trash box, then it is actually removed from the system. The previous boxes are predefined, and the actors must not be allowed to delete them, to change their names, or to move them. Actors are allowed to create new boxes that they can manage arbitrarily. Note that a message may be stored in several boxes and, but the system must keep a unique copy; removing a message from the "trash box" removes it from every other box.

4. Email addresses must adhere to any of the following patterns: "identifier@domain", "alias "; administrators may have email addresses of the form "identifier@", or "alias ". The identifier is an alphanumeric string, the domain is a sequence of alphanumeric strings that are separated by dots, and the alias is a sequence of alphanumeric strings that are separated by spaces.

5. Phone numbers should adhere to the following patterns: "+CC (AC) PN", "+CC PN", or "PN": "+CC" denotes a country code in range "+1" up to "+999", "(AC)" denotes an area code in range "(1)" up to "(999)", and "PN" denotes a number that must have at least four digits. Phone numbers with pattern "PN" must be added automatically a default country, which is a parameter that can be changed by administrators. Note that phone numbers should adhere to the previous patterns, but they are not required to. 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.

6. Readers have books. The system must store the following data regarding such books: a title, an author, a publisher, the language, a description, the number of pages, a status, a category, the moment of creation, a photo and an ISBN. The status can be either "VERY GOOD", "GOOD", "BAD", or "VERY BAD".

7. Readers may sell or exchange their books. In a sale the system must store the moment when the book is sold, a price and a ticker. In an exchange, readers can make an offer. The offer contains a ticker, a book, the moment of creation and an optional comment.

8. Whenever a book is sold, the system must claim to the reader that buys the book a valid credit card. And the system must store the following information according to the credit cards: a holder, a make, a number, an expiration month, an expiration year, and a card verification value (CVV).

9. If a book is going to be exchangeable, the receiver must contribute with the book that will be exchanged. Later, the transmitter may accept or reject the exchange. In this case the system does not claim a credit card.

10. Organizers can create events. For every event, the system must store a title, a description, a date and an address.

11. Sponsors support events by of sponsorships. For every sponsorship, the system must store a URL to a banner, a link to a target page and a valid creditcard.

12. Readers have a finder that they can configure using the following search criteria: a single keyword, a category and a status. The contents of the finder are the books and readers that sell them that match those search criteria.

13. Books have a category, the readers can select from a list that is maintained by the administrators of the system.

14. Readers may write complaints about their books and they are handled by a new kind of actor: referees. For each complaint, the system must store a ticker, a moment, a description, and a number of attachments.

15. Referees write reports on the complaints. For every such report, the system must store the moment when it's written, a description, some attachments and some comments. A comment contains the author of the comment and the comment itself.

Non-functional requirements

16. The system must be available in English and Spanish. (Unless otherwise stated, the data are not required to be available in several languages, only the messages that the system displays.)

17. The system must be easy to customize at run time. The customization includes, but is not limited to: the name of the system (it's "Acme Library" by default); the banner shown at the header (it's the one available at https://tinyurl.com/acme-library by default); the message that is shown on the welcome page ("Welcome to Acme Library, the site to sell your books." is the default welcome message in English; "¡Bienvenidos a Acme Biblioteca! Tu sitio para vender libros." is the default welcome message in Spanish); the default country code in telephone numbers (it's "+34"by default), the brand names, the vat number and the flat fee.

18. The default list of categories must include the following ones: "Sci-fi", "Scientist", "Biographies", "Song", "Romance", "Story", and "Drama" in English; "Ciencia ficción", "Científicos", "Biográficos", "Canciones", "Romances", "Cuentos", and "Dramáticos" in Spanish.

19. Every ISBN consists of thirteen digits (or 10 digits) and whenever it is printed it is preceded by the letters ISBN. The number is divided into four parts of variable length, each part separated by a hyphen.

20. Photos and attachments are not required to be stored in the database, but links to an external system like Pinterest.com just to mention an example.

21. The results of a finder are cached for one hour by default. The administrator should be able to configure that period at will in order to adjust the performance of the system. The minimum time is one hour and the maximum time's 24 hours. When a user requests to clear his or her finder, the system must re-compute its results immediately.

22. The maximum number of results that a finder returns is 10 by default. The administrator should be able to change this parameter in order to adjust the performance of the system. The absolute maximum is 100 results.

23. Wherever the profile of an actor is shown to an administrator, the system must show whether he or she is considered a spammer. Note that "N/A" must be shown in cases in which an actor has not been computed his or her spammer flag.

24. The default list of positive words includes "good", "fantastic", "excellent", "great", "amazing", "terrific", "beautiful", and their corresponding Spanish translations. The default list of negative words includes "not", "bad", "horrible", "average", "disaster", and their corresponding Spanish translations.

25. The default list of spam words includes "sex", "viagra", "cialis", "one million", "you've been selected", "Nigeria", and their corresponding Spanish translations.

26. The system must generate automatic notifications on the following events: a book has been sold, a sponsorship has been shown.

27. The system must accept the following credit card makes: VISA, MCARD, AMEX, DINNERS, and FLY. Other makes are expected to be accepted in future. The administrator should be able to easily manage the list of accepted credit card makes.

28. Every time an event with sponsorships is displayed, a random sponsorship must be selected, and its banner must be shown as little intrusively as possible. Every time a sponsorship's selected, the system must charge a flat fare to the corresponding sponsorship. The fare must include the current VAT percentage. Both the fare and the VAT percentage must be easily customizable by the administrator.

Functional requirements

29. An actor who is not authenticated must be able to:
    1. Register to the system as readers, organizers and sponsors.
    2. List and show all the events, exchanges and sales.

30. 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. Edit his or her social profiles.
    4. Exchange messages with other actors and manage them.
    5. Manage his or her message boxes, except for the system boxes.

31. An actor who is authenticated as a reader must be able to:
    1. Manage their books, which includes listing, showing, creating and deleting them. A book can only be deleted if it's not referenced by any sale or exchange.
    2. Buy books and/or send offers for exchanges.
    3. Manage his or her finder, which involves updating the search criteria, listing its contents, and clearing it.
    4. Manage his or her complaints, which includes listing, showing, creating and writing comments on the reports associated to them.
    5. Manage his or her registers, which includes listing and canceling them.

32. An actor who is authenticated as an organizer must be able to:
    1. Manage his or her events, which includes listing, showing, creating, updating and removing them. Events can be created in final mode which means that is shown to every actor. An event can be deleted as long as is not in final mode.

33. An actor who is authenticated as a sponsor must be able to:
1. Manage his or her sponsorships, which includes listing, showing, creating, updating, and removing them. Note that removing a sponsorship does not actually delete it from the system, but de-activates it. A deactivated sponsorship can be reactivated later.

34. An actor who is authenticated as a referee must be able to:
1. List the complaints that no referee has self-assigned and self-assign one of them.
2. List the complaints that he or she has self-assigned.
3. Write a report regarding any of the complaints that he or she's self-assigned. Reports can be edited as long as they are not saved in final mode. Reports can only be shown to other actors whenever they are saved in final mode.

35. An actor who is authenticated as an administrator must be able to:
1. Create user accounts for new administrators.
2. Manage the catalogue of categories, which includes listing, showing, creating, updating, and deleting them. Note that categories evolve independently from books, which means that they can be created, modified, or deleted independently from whether they are referenced from a book or not.
3. Broadcast a message to all of the actors of the system.
4. Display a listing of suspicious actors. An actor is considered suspicious if he or she publishes some data that includes spam words.
5. Ban an actor who is considered suspicious, which means that his or her user account is de-activated.
6. Unban an actor, which means that his or her user account is re-activated.
7. Manage the lists of positive and negative words that the system uses to compute the scores, which includes listing, showing, creating, updating, and deleting them.
8. Launch a process that automatically de-activates the sponsorships whose credit cards have expired.
9. Launch a process that automatically deletes the books who have been inactive for more than 30 days. A book is considered inactive if it is not related to a sale or an exchange.
10. Launch a process that flags the actors of the system as spammers or not-spammers. A user is considered to be a spammer if at least 10% of the messages that he or she's sent contain at least one spam word.
11. Launch a process that calculates the score of the actors of the system.
   The score will be normalized between -1.0 and 1.0
12. Create user accounts for new referees.
13. Display a dashboard with the following information:
   - Number of sold books by category
   - Top 3 organizers in terms of events
   - Minimum, maximum, average and standard deviation of the books' price
   - Min, max, avg, stddev of the number of books by reader
   - Min, max, media, stddev of complaints by transaction
   - Min, max, media, stddev of active sponsors by event
   - Ratio of active sponsors vs inactive sponsors by event
   - Ratio of full finders vs total finders

- Ratio of empty finders vs total finders
- Ratio of empty finders vs full finders
- Ratio of transactions with complaints
- Top 3 readers in terms of complaints
- Ratio of sales vs exchanges by reader