Acme Handy Worker

Acme, Inc. is a holding that encompasses many companies worldwide, including Acme Handy Worker, Inc. Their business consists in helping customers publish their fix-up tasks and handy workers apply for them.

The goal of this project is to develop a web information system that Acme Handy Worker, Inc. can use to run their business. This document provides an informal requirement specification. Ask your lecturers for clarifications and details, if necessary.

C-level requirements

Information requirements

1. The actors of the system are administrators, customers, and handy workers. For every actor, the system must store a name, an optional middle name, a surname, an optional photo, an email, an optional phone number, an optional address, and an arbitrary number of 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. The system also stores the make of every handy worker; by default, the make is his or her full name, but it can be changed at will.
2. 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, and spam 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 pre-defined 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.
3. Customers publish fix-up tasks. For every fix-up task, the system must store a ticker, the moment when it's published, a description, an address, a maximum price, a period of time to carry it out, a warranty required, and the category to which it belongs.
4. The catalogue of warranties is provided by the system. For every warranty, the system must store a title, its terms, and the applicable laws.
5. The categories of fix-up tasks are organised into a hierarchy by the administrators. Every category belongs to a parent category, but the root category, which is called "CATEGORY".
6. A handy worker may apply for a fix-up task. For every application, the system must store the following data: the moment when the application is registered, its status, an offered price, and some comments. The status can be either pending, accepted, or rejected.
7. Once an application is accepted, the corresponding handy worker may associate a work plan with the corresponding fix-up task. A work plan is composed of an arbitrary number of phases; for each phase, the system must store a title, a description, a start moment, and an

end moment. Multiple phases may overlap, but none of them can be scheduled before or after the period of time during which the corresponding fix-up task must be carried out.

Functional requirements

8. An actor who is not authenticated must be able to:
    1. Register to the system as a customer or a handy worker.
9. 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. Exchange messages with other actors and manage them.
    4. Manage his or her message boxes, except for the system boxes.
10. An actor who is authenticated as a customer must be able to:
    1. Manage an arbitrary number of fix-up tasks, which includes listing, showing, creating, updating, and deleting them.
    2. Manage the applications for his or her fix-up tasks, which includes listing and updating them. A customer may update an application to change its status from pending to either accepted or rejected; if the status is changed to accepted, then a valid credit card must be provided; in either case, he or she can add a comment to the application.
11. An actor who is authenticated as a handy worker must be able to:
    1. Browse the catalogue of fix-up tasks and navigate to the profile of the corresponding customer, which includes his or her personal data plus his or her list of fix-up tasks.
    2. Filter the catalogue of fix-up tasks using the following filters: a single key word that must appear somewhere in its ticker, description, or address; a category to which the task must belong; a warranty required by the task; a range of prices; or a range of dates.
    3. Manage his or her applications, which includes listing them, showing them, and creating them. When a handy worker applies for a fix-up task, he or she can set an offered price, and add some comments.
    4. When a customer accepts an application, then the corresponding handy worker can create a work plan for the corresponding fix-up task. They can fully manage the work plan, which includes showing them, creating, updating, and deleting phases.
12. An actor who is authenticated as an administrator must be able to:
    1. Create user accounts for new administrators.
    2. Manage the catalogue of warranties, which includes listing, showing, creating, updating, and deleting them. A warranty can be updated or deleted as long as it is saved in draft mode. Once it's saved in final mode, it cannot be edited or deleted. Only warranties that are saved in final mode can be referenced by fix-up tasks.
    3. Manage the catalogue of categories, which includes listing, showing, creating, updating, and deleting them. Note that categories evolve independently from fix-up tasks, which means that they can be created, modified, or deleted independently from whether they are referenced from a fix-up task or not.
    4. Broadcast a message to all of the actors of the system.
    5. Display a dashboard with the following information:
        - The average, the minimum, the maximum, and the standard deviation of the number of fix-up tasks per user.
        - The average, the minimum, the maximum, and the standard deviation of the number of applications per fix-up task.
        - The average, the minimum, the maximum, and the standard deviation of the maximum price of the fix-up tasks.

- The average, the minimum, the maximum, and the standard deviation of the price offered in the applications.
- The ratio of pending applications.
- The ratio of accepted applications.
- The ratio of rejected applications.
- The ratio of pending applications that cannot change its status because their time period's elapsed.
- The listing of customers who have published at least 10% more fix-up tasks than the average, ordered by number of applications.
- The listing of handy workers who have got accepted at least 10% more applications than the average, ordered by number of applications.

Non-functional requirements

13. 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.)
14. The system must be easy to customise at run time. The customisation includes, but is not limited to: the name of the system (it's "Acme Handy Worker" by default); the banner shown at the header (it's the one available at https://tinyurl.com/acme-handy-worker-logo by default); the message that is shown on the welcome page ("Welcome to Acme Handy Worker! Price, quality, and trust in a single place" is the default welcome message in English; "¡Bienvenidos a Acme Handy Worker! Precio, calidad y confianza en el mismo sitio" is the default welcome message in Spanish); a list of spam words (it's "sex", "viagra", "cialis", "one million", "you've been selected", "Nigeria", "sexo", "un millón", and "ha sido seleccionado" by default); the applicable VAT percentage (it's "21%" by default); the default country code in telephone numbers (it's "+34"by default); the default list of credit card makes (it's "VISA", "MASTER", "DINNERS", and "AMEX" by default).
15. The system must provide the following leaf categories by default: Carpentry, Ceiling repair, Cleaning, Concrete work, Doors, Electrical wiring, Fan installation, Fence fixing, Home security systems, Insulation installation, Lamp repairs, Moving, Painting, Pest control, Plumbing repairs, Roofing, Shelf installation, Solar panels, Soundproofing, Sprinkler repair, and Window repair. Their names must be displayed appropriately in Spanish or English depending on the language that the principal's selected. The categories must be grouped appropriately into higher-level categories.
16. Photos are not required to be stored in the database, but links to external systems like Pinterest.com or Flickr.com, just to mention a couple of examples.
17. When an actor gets a message that contains a spam word, it must be stored in the spam box instead of the input box.
18. Whenever a price is shown, the corresponding VAT tax must be computed and shown in parenthesis next to the price.
19. Every time that an application changes its status, the system must send a message to both the corresponding customer and the handy worker to keep them posted. The message must be written in both English and Spanish.
20. Applications must be shown according to the following colour scheme: applications that are pending must be shown using the default colour scheme, unless their period has passed, in which case they must be shown in grey; applications that are accepted must be shown in green; applications that are rejected must be shown in orange.
21. Tickers must adhere to the following pattern: "yymmdd-xxxxxx", where "yymmdd" refers to the year, month, and day when the corresponding entity is registered, and "xxxxxx" to a random uppercase alpha-numeric string. No two entities may have the same ticker since it's assumed to be a unique external identifier.

22. 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.

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

24. The system must store the following information about credit cards: a holder name, a brand name, a number, an expiration month, an expiration year, and a CVV code, which is an integer between 100 and 999.

B-level requirements

Information requirements

25. Handy workers can register their curricula. Every curriculum has a ticker, a personal record, some education records, some professional records, some endorser records, and some miscellaneous records.

26. A personal record consists of the full name of a handy worker, a photo of him or her, his or her email, his or her phone number, and a URL to his or her LinkedIn profile.

27. An education record consists of the title of a diploma, the period during which the handy worker was studying, the institution that awarded the diploma, an optional link to an attachment, and some optional comments. Note that an education record may refer to a period that hasn't finished yet if the handy worker's still studying.

28. A professional record consists of the name of the company for which a handy worker was working, the corresponding period of time, the role played, an optional link to an attachment, and some optional comments. Note that a professional record may refer to a period that hasn't finished yet.

29. An endorser record consists of the full name of an endorser, his or her email and phone number, a link to his or her LinkedIn profile, and some optional comments.

30. A miscellaneous record consists of a title, an optional link to an attachment, and some optional comments.

31. Handy workers have a finder in which they can specify some filters: a single key word that must appear somewhere in the ticker, description, or address of a fix-up task; a category to which the task must belong; a warranty required by the task; a range of prices; or a range of dates. The finder stores the fix-up tasks that pass the filters for one hour by default.

32. Customers may write complaints about their fix-up tasks 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.

33. Referees write reports on the complaints. For every such report, the system must store the moment when it's written, a description, and some attachments.

34. Referee reports may have zero, one, or more notes, which can be written by the referee, the customer, or the handy worker who is involved in the corresponding complaint. For every note, the system must store the moment when it was written, a mandatory comment by the actor who creates the note, and optional comments by the other actors involved.

Functional requirements

35. An actor who is authenticated as a customer must be able to:
    1. Manage his or her complaints, which includes listing, showing, and creating them.
    2. Write a note regarding any of the reports that a referee's written regarding any of his or her complaints.
    3. Write a comment in a note regarding a report that a referee's written about any of his or her complaints.
36. 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. Note that he or she must be able to update or delete the report as long as he or she doesn't save it in final mode. Note too, that the corresponding customer or handy worker cannot see the report until it's saved in final mode.
    4. Write a note regarding any of the reports that he or she's written (as long as it was saved in final mode).
    5. Write a comment in a note regarding any of the reports that he or she's written.
37. An actor who is authenticated as a handy worker must be able to:
    1. Change the filters of his or her finder.
    2. Display the fix-up tasks in his or her finder.
    3. List and show the complaints regarding the fix-up tasks in which he or she's been involved.
    4. Write a note regarding any of the reports that a referee's written regarding any of the complaints in which he or she's involved.
    5. Write a comment in a note regarding any of the reports that a referee's written on any of the complaints in which he or she's involved.
38. An actor who is authenticated as an administrator must be able to:
    1. Create an account for a new referee.
    2. Display a listing of suspicious actors. An actor is considered suspicious if he or she publishes some data that includes spam words.
    3. Ban an actor who is considered suspicious, which means that his or her user account is de-activated.
    4. Unban an actor, which means that his or her user account is re-activated.
    5. Display a dashboard with the following information:
        - The minimum, the maximum, the average, and the standard deviation of the number of complaints per fix-up task.
        - The minimum, the maximum, the average, and the standard deviation of the number of notes per referee report.
        - The ratio of fix-up tasks with a complaint.
        - The top-three customers in terms of complaints.
        - The top-three handy workers in terms of complaints.

Non-functional requirements

39. Note that complaints and notes cannot be updated or deleted once they are saved to the database. So, it's required that the system must ask for a double confirmation before saving these entities.
40. 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's one hour and the maximum time's 24 hours.

41. 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.
42. Attachments are not required to be stored by the system, but their URLs to external storage systems like Drive.com or Dropbox.com, to mention a few examples.

A-level requirements

Information requirements

43. Handy workers can write tutorials. For every tutorial, the system must store its title, the moment when it was updated for the last time, a summary, and some optional pictures, plus, obviously, the sections of which it is composed. For every section, the system must store a title, a piece of text, and some optional pictures. (Note that sections must be appropriate numbered.)
44. There's a new kind of actors in the system: sponsors, who support some tutorials by means of sponsorships.
45. The system must store the following data regarding sponsorships: a URL to a banner, a link to a target page, and a valid credit card.
46. Customers may endorse handy workers and vice versa. For every endorsement, the system must store the moment when it's written and some comments.

Functional requirements

47. An actor who is not authenticated must be able to:
    1. Register to the system as a sponsor.
    2. Browse the catalogue of tutorials in the system and display any of them. Note that actors must be able to see the profile of the corresponding handy workers, which includes his or her personal data and the list of tutorials that he or she's written.
48. An actor who is authenticated as a customer must be able to:
    1. Manage his or her endorsements, which includes listing them, showing them, creating an endorsement about a handy worker who has been involved in any of his or her fix-up tasks, updating them, and deleting them.
49. An actor who is authenticated as a handy worker must be able to:
    1. Manage his or her tutorials, which includes listing, showing, creating, updating, and deleting them.
    2. Manage his or her endorsements, which includes listing them, showing them, creating an endorsement about a customer for whom he or she's worked, updating them, and deleting them.
50. An actor who is authenticated as an administrator must be able to:
    1. Launch a process that computes a score for every customer and handy worker. The score is computed building on the endorsements that they've got. The system must analyse the comments in the endorsements and compute the number of positive words (p) and the number of negative words (n). The score must be computed as $p - n$ normalised to range -1.00 up to +1.00 using a linear homothetic transformation.
    2. 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.

Non-functional requirements

51. Whenever a tutorial is displayed, a random sponsorship must be selected and its banner shown, if any. Banners must be shown as little intrusively as possible.

52. Wherever the profile of a customer or a handy worker is shown, the system must show his or her score.
53. 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.