Acme Motorsports

Acme, Inc. is a holding that encompasses many companies worldwide, including Acme Motorsports, Inc. Their business consists in helping race directors publish world championships and riders apply for them to compete in their races.

The goal of this project is to develop a web information system that Acme Motorsports, Inc. can use to run their business. This document provides an informal requirement specification.

C-level requirements

Information requirements

1. The actors of the system are administrators, riders, managers, race directors, and representatives. For every actor, the system must store a 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 race number, a country and the age of every rider.

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. 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. 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 his/her box.

3. Race director may publish world championships. For every world championship, the system must store a name and a description. A world championship is composed of grand prixs.

4. Race director also may issue official announcements for these grand prixs. For every announcement, the system must store the moment when it was published, a title, a description and some attachments.

5. Race director may publish forecasts for these grand prixs which includes the following data: the asphalt temperature, the ambient temperature, the wind speed and direction, the millimetres of rain and the cloud percentage.

6. For every grand prix, the system must store a ticker, the date when it's published, a start date, an end date, that must be 30 minutes after the race, and a number of maximum riders. Also, it belongs to a category and takes place in a circuit. Every circuit has a name, terms, a country, a number of right and left corners and a total length.

7. A grand prix has also one or more qualifyings and a race. Every qualifying has a name, a duration, a start moment and an end moment. Note that there must be 30 minutes between every qualifying of the same grand prix and 1 day between the last one and the race. So, for

every race the system must store a number of laps (which must be higher to 15), the start moment and the end moment.

8. The categories of grand prixs are organised into a hierarchy by the administrators. Every category belongs to a parent category, but the root category, which is called "CATEGORY".

9. A rider may apply for some grand prixs. For every application, the system must store the following data: the moment when the application is registered, its status and some comments. The status can be either pending, accepted, or rejected.

Functional requirements

10. An actor who is not authenticated must be able to:
    1. Register to the system as a race director or a rider.
    2. List the circuits and display them.

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. Exchange messages with other actors and manage them.
    4. Manage his or her message boxes, except for the system boxes.
    5. Browse the riders registered in the system and display any of them. Note that actors must be able to see the profile of the corresponding riders, which includes his or her personal data and the list of social identities they have.

12. An actor who is authenticated as a race director must be able to:
    1. Create a world championship.
    2. Manage an arbitrary number of grand prixs, which includes listing, showing, creating, updating, and deleting them as long as they are not saved in final mode. Also, he or she may cancel it if is necessary at any moment. Note that grand prix may be saved in final mode if it has at least one qualifying and one race associated to this grand prix.
    3. Issue official announcements of his or her grand prixs and manage them which includes listing, showing, creating and updating or delete them as long as they are not saved in final mode.
    4. Manage the qualifyings and the race associated to his or her grand prix which includes creating, showing, listing, updating or deleting them as long as their grand prix is not saved on final mode or cancelled.
    5. Manage the catalogue of circuits, which includes listing, showing, creating, updating, and deleting them.
    6. Publish a forecast of his or her grand prixs, which includes showing, creating, updating them.
    7. Manage the applications for his or her grand prixs, which includes listing and updating them. A race director may update an application to change its status from pending to either accepted or rejected; if the status is changed to rejected, then a reason must be provided.

13. An actor who is authenticated as a rider must be able to:
    1. Browse the catalogue of world championships and navigate to their grand prixs. Also, he or she must be able to list their races, qualifyings and circuits and display them.
    2. Filter the catalogue of grand prixs using the following filters: a single key word that must appear somewhere in its ticker or description; a category to which the grand prix must belong; a circuit required by the grand prix; or a range of dates.

3. Manage his or her applications, which includes listing them, showing them, and creating them. When a rider applies for a grand prix, he or she can add some comments. Note that a rider only may apply for a grand prix if it is saved on final mode and it is not cancelled.

14. 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 grand prixs, which means that they can be created, modified, or deleted independently from whether they are referenced from a grand prix or not.
    3. Broadcast a message to all of the actors of the system.
    4. Display a dashboard with the following information:
       - The average, the minimum, the maximum, and the standard deviation of the number of grand prixs per race directors.
       - The average, the minimum, the maximum, and the standard deviation of the number of applications per grand prixs.
       - The average, the minimum, the maximum, and the standard deviation of the maximum riders of the grand prixs.
       - The ratio of pending applications.
       - The ratio of accepted applications.
       - The ratio of rejected applications.
       - The listing of race directors who have published at least 10% more grand prixs than the average, ordered by number of applications.
       - The listing of riders who have got accepted at least 10% more applications than the average, ordered by number of applications.

Non-functional requirements

15. 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.)
16. 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 Motorsports" by default); the banner shown at the index page (it's the one available at https://www.motorsport-safety.org/sites/default/files/memberprofilebanner.png by default); the message that is shown on the welcome page ("Welcome to Acme Motorsports! Racing, quality, and competition in a single place" is the default welcome message in English; "¡Bienvenidos a Acme Motorsports! Carreras, calidad y competición 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 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).
17. The system must provide the following leaf categories by default: Motorbikes: Moto3, Moto2, MotoGP, MxGP, MxGP2, Superbikes, Supermoto, CEV, Enduro, Superenduro and Dirt track.

Cars: Formula1, GP2, Rallycross, Land Rush, Rally, Nascar, Raid, Indianapolis and Drift. Quads: Quad Cross, Beach Cross, Endurance Racing and Quad Tournament. Trucks: Monster Jam, Trade trucks, Volvo Trucks, Tuff Challenge, Tough Challenge and Super Trucks. Buggies: Baja, Club Handicap, Greenock, Peter Lynn Competition, Belton Park and Extreme. The categories must be grouped appropriately into higher-level categories.

18. Photos are not required to be stored in the database, but links to external systems like Instagram.com or Flickr.com, just to mention a couple of examples.

19. When an actor gets a message that contains a spam word, it must be stored in the spam box instead of the input box.

20. Note that a qualifying or a race cannot be associated to a grand prix if it is saved on final mode.

21. The system must notify every time that an application changes its status, the system must send a message to both the corresponding race director and the rider to keep them posted. Also, if a grand prix is cancelled or an official announcement is issued to the corresponding riders.

22. Applications must be shown according to the following colour scheme: applications that are pending must be shown in yellow, applications that are accepted must be shown in green; applications that are rejected must be shown in red.

23. Tickers must adhere to the following pattern: "ddmmyy-xxxx", where "ddmmyy" refers to the day, month and year when the corresponding entity is registered, and "xxxx" 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.

24. 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.

25. 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 alphanumeric strings that are separated by spaces.

26. 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

27. Riders can manage their palmares. A palmares is composed of zero or more victories, zero or more podiums, zero or more fastest laps, zero or more poles and zero or more world champions. For every one the system must store the team, a year, an optional category and an optional circuit. Note that categories or circuits may not exist when palmares its registered.

28. A victory consists of some optional photos and some optional attachments.

29. A fastest lap consists of the fastest time achieved, the lap when it was registered and some optional rider comments.
30. A podium only stores the position was achieved when it occurred. Remember that when a rider gets a podium, he or she has achieved a position higher or equals to three.
31. A pole only stores the time rider achieved.
32. A world champion stores some optional photos of the celebration, the points he or she achieved in that championship (higher than zero) and some optional special thanks.
33. Riders have a finder in which they can specify some filters: a single key word that must appear somewhere in the ticker or in the description; a category to which the grand prix must belong; a circuit required by the grand prix; or a range of dates. The finder stores the grand prixs that pass the filters for two hours by default.
34. There is a new kind of actor in the system: representatives. A representative manages a fan club who supports a rider during all the world championship. Every fan club has a name, a summary, the number of fans they are composed of, the moment when it was established, an optional banner and some optional pictures.
35. A representative may settle in a sector of a circuit and he or she must attach one of their fan clubs. For every sector, the system must store the circuit, a number of rows and columns and the name of the stand their fan club will be settled in during the grand prix period.
36. Managers may answer the official announcements, that stores the moment when it is answered, some optional comments, if he or she is agree or not and the reason why.
37. Managers also handles teams which is a kind of an agreement between them and riders. For every team, the system must store a unique name, the moment when it was established, a number of contract years, its main colours, an optional logo, the factory name who supports them and the year budget. Note that when a team is created or updated, the manager can associate only up to two free riders to his or her team. It means, these riders must not belong to a team.

Functional requirements

38. An actor who is not authenticated must be able to:
    1. Register to the system as a representative.
39. An actor who is authenticated as a manager must be able to:
    1. Answer official announcements and manage their team answers which includes listing, showing, and creating them.
    2. Manage their racing teams which includes listing, creating, updating, showing or deleting them.
40. An actor who is authenticated as a representative must be able to:
    2. Manage his or her fan clubs which includes listing, showing, creating, updating and deleting them.
    3. Settle one of their fan clubs in a circuit sector.
    4. List the riders and navigate to their profiles and social identities.
41. An actor who is authenticated as a rider must be able to:
    1. Change the filters of his or her finder.
    2. Display the grand prixs in his or her finder.
    3. Show the team he or she belongs if any.

4. Manage his or her palmares which includes listing, showing, updating, deleting and creating it.

42. An actor who is authenticated as an administrator must be able to:
   1. Display a listing of suspicious actors. An actor is considered suspicious if he or she publishes some data that includes spam words.
   2. Manage the sectors of a circuit which includes listing, showing, creating and updating them.
   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 total announcements per grand prix.
      ▪ The minimum, the maximum, the average, and the standard deviation of the number of sectors per circuit.
      ▪ The ratio of grand prix with a sector.
      ▪ The top manager in terms of answers.
      ▪ The top-three circuits in terms of sectors.
      ▪ The top representative in terms of fan clubs.

Non-functional requirements

43. Note that managers can only answer announcements if they are in final mode.
44. Note that a sector be only settled in if their capacity is higher to fan club number of fans.
45. 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.
46. The maximum number of results that a finder returns is 12 by default. The administrator should be able to change this parameter in order to adjust the performance of the system. The absolute maximum is 50 results.
47. Attachments are not required to be stored by the system, but their URLs to external storage systems like Flickr.com or Pinterest.com, to mention a few examples.

A-level requirements

Information requirements

48. Representatives and riders may register meetings. For every meeting, the system must store the moment when it was, the place, a number of signatures and photos offered to one of their fan clubs and the how long approximately it was. Note that due to different conditions a meeting may have been cancelled by one of them.
49. There's a new kind of actors in the system: sponsors, who support a team by means of sponsorships.
50. 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.

Functional requirements

51. An actor who is not authenticated must be able to:
    1. Register to the system as a sponsor.
52. An actor who is authenticated as a rider must be able to:
    1. Manage his or her meetings, which includes listing them, showing them and creating a meeting about a representative who is involved in his or her fan club.
53. An actor who is authenticated as a representative must be able to:
    1. Manage his or her meetings, which includes listing them, showing them and creating a meeting about a rider who is involved in one of his or her fan clubs.
54. An actor who is authenticated as an administrator must be able to:
    1. Launch a process that computes a score for every representative and rider. The score is computed building on the meetings that they've got. The system must analyse the comments in the meetings 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

55. Whenever a team is displayed, the sponsorship must be shown, if any. Banners must be shown as little intrusively as possible.
56. Wherever the profile of a rider or a representative is shown, the system must show his or her score.
57. 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.