

Acme Gallery

Acme, Inc. is a holding that encompasses many companies worldwide. One of them is Acme Gallery, Inc., which specializes in managing museums and organize their visits.

Information requirements

1. The actors of the system are administrators, directors, visitors, sponsors, guides and reviewers. For every actor, the system must store a name, the surnames, an email, a phone number (which must follow the pattern: optional plus sign and a sequence of numbers), an optional address and optional gender (which can be male, female, or other).
2. Directors can create museums. For every museum, the system must store its name, an address, its GPS Coordinates, an email, a phone number, an optional title and a unique identifier chosen by the director and composed of 1 to 4 letters (case sensitive) (i.e. *MdP* for “Museo del Prado” and *MDP* for “Museo de Picasso”). Also, an optional banner can be provided.
3. A museum sells several day passes. There are two kinds of day passes: general and private day passes. General day passes give access to public areas of the museum whereas private ones do also grant access to some private exhibitions. For every day pass the system must keep track of: the price (which must be greater or equal than a symbolic quantity – that is, 1€, 1\$ or 1£ where applicable –), purchase and visit dates, the corresponding room in case it's a private exhibition and a unique identifier (following the pattern *AAAA-uuuu-XXXX* where “AAAA” is the unique identifier of the museum, “uuuu” is the user name and “XXXX” are numbers). Day passes can never be deleted.
4. Museums are composed of rooms. The system must store the following data for each room: the name of the room and its size (in m²).
5. Directors can optionally create a store per museum. For each store, the system must keep track of the name, a logo, a telephone number, and an email.
6. A store is composed of products, which are managed by the director of the museum. For each product, the system must keep track of a name, a description, a set of pictures, a price and a barcode which must follow the standard EAN13.
7. Visitors that had visited the museum can write reviews about it. For every review, the system must keep track of a body, a scoring (going from 1 to 5) and the moment of creation.
8. Directors organize exhibitions. For every exhibition, the system must store a unique identifier (which must follow the pattern: *uuuu-XXXX* where “uuuu” is the username of the actor creating the exhibition and “XXXX” is a string chosen by the director. Both have a variable size), a title, the room where is going to take place, a description, a starting date, an end date and a collection of links to external webpages that provide further information about the author.

9. Exhibitions can be either public or private. A day pass must be purchased in order to access private exhibitions whereas public ones can be visited by all the visitors of a museum.
10. An exhibition belongs to a category. For each category, the system must store a name, which must be unique within the context of the same parent category; that is, several categories may have the same name as long as they do not have the same parent. Categories are organized into a tree whose root is a fictitious category called "CATEGORY".
11. An exhibition is led by one or more guides. In order to help visitors, each guide can create some highlights. For every highlight the system must store: the title of the work of art, a photograph, an optional name of the creator, a short remark and an optional year. Highlights can be saved in draft mode, which allows it and its fellow guides to modify it later. Draft highlights should never be shown to visitors and must only be modified by guides of the corresponding museum. Final mode freezes them forever.
12. Reviewers rate exhibitions. For every critique, the system must keep track of a title, a description, a scoring (going from 1 to 5) and the creation date. Critiques must be created before the corresponding exhibition has started.
13. Sponsors can request to sponsor an exhibition. These requests can be either ACCEPTED, PENDING, TIME_NEGOCIATION, REJECTED or EXPIRED. When a request is made by a sponsor, its initial status is 'PENDING'; later, the corresponding director can change it to 'TIME_NEGOCIATION', sending the period in which the sponsorship will be active for that exhibition, or 'REJECTED'. The sponsor must now change the status to 'ACCEPTED' by entering a CreditCard or change it to 'REJECTED'. In case the sponsor does not change the status before the sponsorship starting date, the request is flagged as EXPIRED.
14. A sponsorship consists of an image that will appear whenever an exhibition is displayed, starting and ending dates of the campaign. The image must be linked to an external web page.
15. Visitors can create groups. For every group, the system must keep track of the name, a short description (maximum 250 characters), the moment when it was created, the maximum number of participants (only for open groups) and the meeting date.
16. A group may have several announcements. For every announcement, the system must store the title, the description and an optional picture.
17. A group may have several comments. For every comment, the system must store the title, the description and an optional picture.
18. The creator of a group can send invitations, as a host, to other visitors (guests) in order to join closed groups. For every invitation, the system stores an optional message and the moment when the invitation was sent.
19. Directors organize events. For each event, the system must keep track of a title, a description, the starting and ending dates, a list of requirements and an optional set of attachments.

20. Guides can inform about incidents. For every incident, the system must store a text, a level of severity (which can be LOW, MEDIUM or HIGH) and an optional room where it was found.

Functional Requirements

21. An actor who is not authenticated must be able to:

1. Register to the system as a visitor.
2. Register to the system as a sponsor.
3. List the directors of the system.
4. Display the directors' profiles, which must include their personal data and the list of museums that they manage.
5. Search for exhibitions (public and private together) using a single key word that must be contained either in their identifier, title or description.
6. Browse the list of exhibitions by navigating the tree of categories.
7. Display an exhibition, which must include the list of guides, final mode highlights and critiques associated to it. Whenever an exhibition is shown, its corresponding sponsorship must be displayed (that is, the one that is currently active, if any).
8. Navigate from a museum to its associated exhibitions.
9. Display a critique.
10. Display a final mode highlight.
11. Search for events using a single key word that must be contained either in their title or description.
12. Display an event.
13. Navigate from a museum to its associated events.
14. List the museums of the system.
15. Display a museum, which must include the list of reviews associated to it ordered by date.
16. Navigate from every museum to the profile of the corresponding director.
17. Navigate from every museum to the corresponding store, if any.
18. Display a store, which must include the list of products associated to it.
19. Display a product.

22. 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.

23. An actor who is authenticated as an administrator must be able to:

1. Ban a visitor she or he considers is not properly using the system.
2. Ban a sponsor she or he considers as spammer, scammer or the like.
3. Create an account for a new director.
4. Create an account for a new guide.
5. Create an account for a new reviewer.
6. List all the groups of the system.
7. Display a group and navigate to the profile of the corresponding coordinator (the creator). The display must include the list of announcements and comments associated to that group.

8. Navigate from a group to the museum associated to it.
9. List the taboo groups. A group is taboo if it contains taboo words in its name or description.
10. Remove a group that she or he considers inappropriate.
11. List the taboo announcements. An announcement is taboo if it contains taboo words in its title or description.
12. Remove an announcement that she or he considers inappropriate.
13. List the taboo comments. A comment is taboo if it contains taboo words in its title or description.
14. Remove a comment that she or he considers inappropriate.
15. Create a new category for the tree of categories.
16. Delete a category of the tree of categories. The root category cannot be deleted.
17. List the taboo reviews. A review is taboo if it contains taboo words in its body.
18. Remove a review that she or he considers inappropriate.
19. List the taboo words in the system.
20. Add a new taboo word to the list of taboo words.
21. Delete a taboo word from the list of taboo words.
22. Display a dashboard with the following information:
 - i. The average, the minimum, the maximum and the standard deviation for the number of museums managed per director.
 - ii. The average ratio of private vs public exhibitions per museum, having at least one public exhibition.
 - iii. The top 5 more visited private exhibitions.
 - iv. The top 5 museums with more events.
 - v. The average, the minimum, the maximum and the standard deviation of the price of day passes of a museum (only entrance).
 - vi. The average, the minimum, the maximum and the standard deviation of the price of the private day passes.
 - vii. The average, the minimum, the maximum and the standard deviation for the number of day passes sold per museum.
 - viii. The ratio of sponsorships with status 'REJECTED'.
 - ix. The ratio of sponsorships with status 'ACCEPTED'.
 - x. The ratio of sponsorships with status 'PENDING'.
 - xi. The ratio of sponsorships with status 'TIME_NEGOCIATION'.
 - xii. The ratio of sponsorships with status 'EXPIRED'.
 - xiii. The listing of exhibitions that have at least 10% more sponsorships than the average.
 - xiv. The top 3 guides with less exhibitions.
 - xv. The average and the standard deviation of the number of critiques per exhibition.
 - xvi. The average and the standard deviation of the number of highlights per exhibition.
 - xvii. The ratio of banned visitors.
 - xviii. The ratio of banned sponsors.
 - xix. The average and the standard deviation of the number of participants per open group.
 - xx. The ratio of visitors who have ever created a group versus the visitors who have never created any group.

- xxi. The groups whose number of announcements is above 75% the average number of announcements per group.
- xxii. The average and the standard deviation of replies per comment.
- xxiii. The ratio of museums with a gift store.
- xxiv. The 3 museums with more high-severity incidents.

23. An actor who is authenticated as a director must be able to:

1. List all the groups of the system associated to her or his museums.
2. Display a group and navigate to the profile of the corresponding coordinator (the creator). The display must include the list of announcements and comments associated to that group.
3. Navigate from a group to the museum associated to it.
4. Create an exhibition. Only an exhibition can take place in the same invitat at the same time.
5. Edit the details of any exhibition she or he has created.
6. Delete any exhibition she or he has created.
7. Create an event.
8. Edit the details of any event she or he has created.
9. Delete any event she or he has created.
10. List the incidents for the museums she or he manages (first the pending ones and then the checked ones).
11. Navigate from a museum to the list of associated incidents.
12. Mark an incident as checked.
13. Remove an incident she or he doesn't consider as one.
14. Navigate from a museum to the list of associated rooms.
15. Mark a room as "in repair", if currently no exhibition is taking place there.
16. Mark a room as "available", if currently no exhibition is taking place there.
17. List all the sponsorship request that the exhibitions from the museums that she or he manages have received, ordered by status.
18. Change a sponsorship status from 'PENDING' to 'TIME_NEGOCIATION' by selecting a period in which the exhibition has no active sponsorships.
19. Change a sponsorship status from 'PENDING' to 'REJECTED'.
20. Create a museum. Museums cannot be deleted.
21. List the museums that she or he manages.
22. Edit the basic information of a museum that she or he manages.
23. Create a gift store for a museum that she or he manages. Only one store per museum can be created.
24. Edit the basic information of the gift store of a museum that she or he manages.
25. Delete a gift store for a museum that she or he manages.
26. Create a product for the gift store of a museum that she or he manages. Products cannot be edited.
27. Delete a product for the gift store of a museum that she or he manages.

24. An actor who is authenticated as a visitor must be able to:

1. Edit his or her personal data.
2. Create a new group (which she or he automatically joins). The basic properties of a group cannot be edited (name, description, creation moment, maximum number of participants and the date of the meeting).

3. List the open groups of the system.
 4. List the groups that she or he is a member of.
 5. List the groups that she or he has created.
 6. Display an open group and navigate to the profile of the corresponding coordinator (the creator). The display must include the list of announcements and comments associated to that group.
 7. Display the closed groups which she or he is a member of and navigate to the profile of the corresponding coordinator (the creator). The display must include the list of announcements and comments associated to that group.
 8. Navigate from a group to the museum associated to it.
 9. Join an open group. A visitor can't join a group if the maximum number of participants equals the current number of participants or if the date of the meeting is in the past.
 10. Quit a group. A visitor can't quit a group if she or he is its coordinator or if the date of the meeting is in the past.
 11. Remove a group that she or he coordinates if no one (except for herself or himself) belongs to its participants and the date of the meeting is in the future.
 12. Create an announcement for a group that she or he coordinates. Announcements cannot be edited nor deleted by a visitor.
 13. List a stream with the announcements of the groups which she or he is a member of (including the ones she or he has created) ordered by date of creation of the announcement.
 14. Comment on a group which she or he is a member of. Comments cannot be edited nor deleted by a visitor.
 15. Reply to a comment on a group which she or he is a member of.
 16. Send invitations, as a host, to other visitors to join a closed group that she or he has created. An invitation for a group can only be sent if the meeting date of the group is in the future and the recipient doesn't already have a pending invitation for that group. Invitations cannot be edited nor deleted.
 17. List the invitations that she or he has received, as a guest, ordered by the sending date.
 18. Accept an invitation that she or he has received, as a guest (even if the meeting date of the group is in the past).
 19. Decline an invitation that she or he has received, as a guest.
 20. Buy a day pass for a private exhibition by entering a credit card. Day passes cannot be edited or deleted.
 21. Buy a day pass for a museum by entering a credit card. Day passes cannot be edited or deleted.
 22. List the day passes that she or he has bought.
 23. Write a review about a museum.
25. An actor who is authenticated as a sponsor must be able to:
1. Request to sponsor an exhibition.
 2. List all her or his sponsorships ordered by status.
 3. Change a sponsorship status from 'TIME_NEGOCIATION' to 'ACCEPTED' by entering a credit card.
 4. Change a sponsorship status from 'TIME_NEGOCIATION' to 'REJECTED'.

26. An actor who is authenticated as a guide must be able to:
1. Report an incident.
 2. List the incidents of the museums for which she or he works (first the pending ones and then the checked ones).
 3. Create a highlight for an exhibition of a museum she or he works for. Highlights can be saved in draft mode or final mode, which freezes them forever.
 4. Edit a highlight for an exhibition of a museum she or he works for, if it's in draft mode.
 5. Delete a highlight for an exhibition of a museum she or he works for, if it's in draft mode.
27. An actor who is authenticated as a reviewer must be able to:
1. Rate an exhibition by creating an elaborated critique associated to it. Critiques must be created before the corresponding exhibition has started.

Non-Functional Requirements

28. The system must be available in both English and Spanish.
29. Photos are not required to be stored in the system, but their links to external storage systems like Flickr.com, Tumblr.com or the like.
30. The system must be as efficient as possible.
31. The "Terms and Conditions" document must make it explicit why a visitor or a sponsor may be banned by the administrator.
32. The "Terms and Conditions" document must make explicit the reasons why a group, announcement, comment or review may be considered as inappropriate and thus, may be removed from the system by the administrator.
33. The system will be run in Spain, so it must comply with the Spanish regulations except for: the requirement in LOPD regarding keeping files and communications secure and the requirement in LSSI regarding informing the Chamber of Commerce about the internet domain.
34. Exhibitions or Events that have passed must be flagged in listings and whenever they are displayed.
35. The system must be configured with the following taboo word by default: "sex", "viagra", "cialis", "sexo" and "porn".
36. Closed groups can only be fully displayed by its members.
37. The default VAT tax is 20%.
38. The default tree of categories is ("CATEGORY" → ("Paintings" → ("Byzantine Painting", "Renaissance", "Baroque", "Rococo", "Contemporaine")), ("Sculptures" → ("Mesopotamia", "Egypt", "Ancient Greece", "Gothic")), "Other Arts" → ("Modern Arts" → ("Abstract Art", "Modern Style", "Postmodern Era", "Avant-Garde", "Pop History")))

39. Whenever a sponsorship is shown to either directors or sponsors, it must be rendered differently depending on its status. ACCEPTED sponsorships should be rendered in grass-green (#42f46b), TIME_NEGOCIATION ones should use a yellowish tone (#e9f241) unless the corresponding proposed starting period starts in less than a week, in which case, an orange hue to attract user's attention is requested (#f4aa42). PENDING sponsorships should use light royal blue as color (#41a6f4), whereas REJECTED will use a reddish hue (#f45642). Finally, EXPIRED sponsorships will be rendered using light purple (#d9baff).
40. Prices are stored without taxes, except for the day pass, which must show the final price.