Teaching Case:

Colonial Heritage Foundation:
A Conceptual Modeling Case

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Abstract

The Colonial Heritage Foundation (CHF) is a volunteer organization that sponsors American Colonial Era reenactment events. It needs an information system to help it coordinate several of its operations. This case details the information requirements for three CHF activities. The first pertains to the management of public events. In a public event, volunteers assemble to demonstrate daily living and military activities from the British Colonies of North America. The foundation needs to be able to schedule and track various kinds of information regarding the volunteers and the activities that make up such an event. Secondly, the foundation needs a system to track the rental of various wardrobe items that are made available to volunteers. Finally, CHF needs a system to facilitate the year-round sale of items produced by foundation artisans. This case provides a textual description of each of these sub-systems as well as proposed solutions in the form of UML class diagrams. Additionally, a PDF version of the event guide for one of the public events is provided. CHF is a real non-profit foundation and the details of this case describe real needs of the organization.

Keywords: Conceptual Modeling, database design, business case.

1. BACKGROUND

The Colonial Heritage Foundation (the Foundation) is a 501(c)(3) public charity dedicated to the preservation of the values, culture, skills and history of America's founding. To accomplish this mission, the Foundation engages in a broad array of activities. Among these are the development and presentation of educational exhibits, the coordination of reading and discussion groups to encourage the study of America's historical writings, the presentation of lectures regarding America's founding era, the coordination of historical reenactments and skill demonstrations, the coordination of internships and apprenticeships that teach the occupational skills of early America, and the coordination of public events that showcase the culture, skills, history, and values of America's founding era.

2. PUBLIC EVENTS

The Foundation began as a group of a few people who wanted to provide an educational, Colonial American event for the public as a part of the Independence Day celebrations in Utah County, Utah. This kind of activity remains central to Foundation's operations. Although it plays supporting roles on in several reenactment events, the only event that is run solely by the Foundation is its flagship event: the Colonial Heritage Festival.

The Colonial Heritage Festival
The Colonial Heritage Festival is an annual event scheduled for the week of the Fourth of July. Running three or four days, the event attracts around 40,000 visitors each year. Held in the Scera Park in Orem, Utah, it has become the

largest colonial living and reenactment event in the western United States. The festival comprises dozens of exhibits and presentations from more than 100 volunteers. The festival is free to the public; for a feeling about its scope, visit http://festival.colonialheritage.org.

The festival is overseen by Gregg Hardy and he manages the set-up and take-down of the event; his wife, Katherine Hardy supervises the participants who perform and demonstrate at the festival. Administrative details for the event are supervised by Genelle Pugmire. Coordinating such an event is a daunting task and requires that many details be managed. Currently, the Foundation sponsors this event and one named "Rebels and Redcoats" in Phoenix, Arizona. The foundation would like to sponsor other similar events in the Western US. The following sections discuss the information requirements of managing such events in the context of the Colonial Heritage Festival.

Volunteers

All participants of the festival are volunteers. Katherine and Genelle work closely with many individuals in fulfilling their responsibilities for the festival. They need various information about each volunteer. They need basic contact information (e.g. address, home phone, cell phone, email address). Other people volunteer for the foundation without being directly involved in the festival. For example, Glenn works with local businesses to raise funds and Kirsten gives time to develop promotional materials.

Participants

Katherine works with volunteers who perform during the event; Genelle works with those who take more supportive roles. In general, these individuals are called participants. Those who perform always dress in period attire while those in supporting roles may or may not. Many performers portray individuals from the time period relevant to the event and present themselves as being from the period. These are called reenactors. Others demonstrate skills or trades but do not present themselves being from the relevant time period. These are called artisans. Still others participate in educational roles; they provide information about what is being displayed or exhibited. These are called educators. Each of the performers is either a reenactor, an artisan or an educator. Participants who fill supporting roles are called staff.

In addition to the information that Katherine needs for all volunteers, she must record emergency contact information for each participant. This requires a name of the emergency contact, the relationship that the contact has with the participant and a telephone number. Finally, Katherine likes to have a brief biographical sketch for each participant. This is not currently required of any participant, but Katherine anticipates producing promotional materials that feature event participants, so she is collecting biographical information now as it is convenient.

Because of security concerns, the Foundation needs a picture of each participant. Genelle hopes to use these pictures to create ID badges to identify all event participants.

Katherine and Genelle supervise participants. These are volunteers who work directly to support event and are discussed in more detail below.

Areas

The Festival has many areas. An area fulfills a particular need at an event. Some areas are administrative in nature such as security, and information booths, others are exhibits that present historical information to attendees. Each exhibit focuses on a particular interest. Examples of exhibits are: a bakehouse, a cooperage, an exhibit on Jamestowne, and the Olde South Church where various performances take place. In one sense, the festival is made up of these different areas (administrative as well as exhibitory). Currently, each area is supervised by either Katherine or Genelle and each area has a volunteer who oversees the area and coordinates with the area supervisor. This person is the area's coordinator. Each area also has (potentially) many participants who are working in the area during the festival. It is often the case that the volunteer who is the coordinator for the area is also one of the participants in the area.

A participant fills one role at an area. For example, Darold makes casks, buckets and barrels. At the "Cooperage" area, he fills the "cooper" role. One or more participants may fill the role of "apprentice cooper" in the cooperage. It is possible for a participant to work in more than one area. In fact, Darold also fills the role of Broom-maker in the broom-making area. It also happens that Darold is the coordinator for the cooperage area.

Shane Jones, is the coordinator for an area called "Fiber Arts." Although he is not a participant in the area, he schedules different artisans to display activities like spinning flax or wool into

thread and yarn as well as weaving, carding, and lace-making.

When a participant fulfills a role, he or she may do it as a reenactor. If a role is filled as a reenactor, it is important to know some information about the person being portrayed. The person being portrayed may be real or fictional but in either case, is referred to as a historical figure. Katherine likes to be able to keep track of which historical figures have been represented at an event as well as some other information about each. For each historical figure, she needs to know birthdate and birthplace, death date and death place, whether the figure is real or fictional. She also like to have a biographical note on the figure.

Finally, each exhibit may have many items that are offered for sale. While Katherine does not need to record the sale of the items, she does need to know the name and description of items for sale and an approximate price range for those items for inclusion on the festival website. Only period-appropriate items are permitted to be sold at the festival, so Katherine needs a way to know what items have been approved for sale at each area. Katherine must report to the Utah State Tax Commission details about each individual or organization who sells items during the festival. Information needed for this report is the name of the individual or organization that is selling items, an address, the name and phone number for the individual or contact person for the organization and one of three identifiers used by the Tax Commission: for individual taxpayers, a social security number; for organizations, either the Federal Employer Identification Number (EIN) or the Utah state taxpayer identification number. Additionally, Katherine is responsible for delivering special-event sales tax return forms to each exhibit that sells items.

Locations
There are two kinds of locations that are important for volunteers to know for any public event. The first is the venue for the event itself. Each event is held at a venue. For example, in 2016 the Colonial Heritage Festival was held at the Scera Park in Orem, Utah; Rebels and Redcoats is typically held at the Pioneer Living History Museum near Phoenix, Arizona. Because participants will need to find the venue, the address of the event needs to be available in the system so it can be sent to the appropriate volunteers. However, many potential attendees will know the venue by name so the name of the venue must be recorded as well as its address.

Secondly, each area at an event will be assigned a location within the venue. This is important so that area coordinators know where to set up their areas. This is somewhat more difficult to communicate than is the venue location. For each event, an area map is created that lists physical locations by number. These physical locations are termed "places". Each area is assigned a place number. These numbers are marked at the event venue (usually with a stake in the ground) so participants can find the correct place for their area. The map that lists place numbers within the venue location is created as a PDF document and its filename needs to be recorded with other information about the event so the appropriate file can be attached to email correspondence with area coordinators.

Event Information
The system needs to keep track of some specific information about each event. Although the Foundation currently sponsors just two annual events, it anticipates growth and wants to be ready for multiple similar events. Because events are expected to be recurring, general information about the event should be maintained as well as information about a specific occurrence of the event. General information includes items that are the same year after year, such as the event's name and a description of the event. However, the start date and the end date, will be different each year and locations may change periodically as well.

3. ITEM RENTALS

When the Colonial Heritage Festival began, there were just a few participants and most of them had their own period clothing. As the event grew and interest increased, many people volunteered who did not already have appropriate attire. Each year, a few more costumes were made and loaned to volunteers. Now, the Foundation owns a substantial wardrobe—and it grows each year as volunteers make clothing to outfit other volunteers. Additionally, some participants have articles of period clothing that they loan to the foundation to help outfit volunteers.

In the past, Katherine has coordinated loaning out these items to festival participants. As yet, there has been no systematic way to record which items have been lent or to whom they have been loaned. Katherine has just relied on people's personal integrity to return items. The problem is that people sometimes forget to return items they have borrowed and because there are no

records kept, it is impossible to follow up with people who have borrowed items without returning them.

Decision to Build a System

To solve the wardrobe problem, the board of directors of the Foundation has decided to build an information system to track when it lends an item to an individual as well as to track when that item is returned. Although the primary current need is to handle clothing items that are loaned to festival participants, Alan Rex (a member of the board of directors) proposed that it might make sense to use the Foundation's wardrobe as a revenue source. At a meeting to discuss management of wardrobe lending, Alan said, "Once we have a system in place to really keep track of wardrobe items, we could rent them to anyone throughout the year." As the board members continued to discuss the possibility another member suggested that the system should not be limited just to wardrobe. Any item that the Foundation controls could potentially be rented out. Genelle, another board member, raised a concern, "Some of our items are irreplaceable, and should not be lent out at all." Alan responded, "not a problem, we could have a way to flag each item as being rentable or not." As the board discussed the issue, they decided that making a general system to handle rentals made more sense than making a system just to handle wardrobe items.

Items

In the language of the Foundation, an Item is anything that the foundation controls. The foundation owns some period artifacts, and a few more replicas. Still more are on loan to the Foundation by private collectors or other organizations. The Foundation is responsible for the care and security of items on loan. An example of a non-wardrobe item that the foundation owns is a scale model of the Mayflower, which it is currently building. Upon its completion, it will be the largest scale model of the Mayflower in existence. The Foundation controls a replica 18th century printing press, which is on loan from a private collector. Every item has a name, a description and a value. For all items, the Foundation also needs basic contact information about the person (or organization) who owns it. In addition, the Foundation wants at least one photograph of every item it owns or otherwise controls. Each item has a name that is used to identify it as it is discussed in meetings and plans for its use are made. Each item also has a textual description of arbitrary length.

Finally, each item has a replacement value, which is the amount for which a renter would be liable if the item were lost or destroyed during the rental.

Wardrobe Items

Wardrobe items are items in every sense, but there is more information that needs to be recorded for their effective management. To manage wardrobe items effectively, Kathrine needs to know the size of the item, whether it is intended for men or women to wear (or if it is gender neutral), the color of the item, a description of the pattern in the fabric, and a start year and end year to indicate the period in which the article was in fashion. For example, one wardrobe item might be a size 42 green paisley waistcoat. The particular cut of the item was in fashion from 1750 through 1780. Waistcoats were only worn by men. It is the case with most Colonial American clothing that a particular kind of item was gender specific.

Identifying the size of items can be complex. Katherine has indicated that she would like to have a single "size" field that is numeric but also needs a "size modifier" field that is a text value that can be used to describe the size more precisely. So for breeches, the waist size would be recorded in the Size field while the length of leg and cuff circumference would be recorded in the Size Modifier field. Katherine has indicated that she would also like to be able to record a free-form note about any wardrobe item.

Rentals

The rental system needs to allow for all kinds of items (whether they are regular items or wardrobe items) to be rented. However, each item needs some way to mark if it is available for rental. Additionally, each item needs to have a standard daily rental fee recorded.

When a rental transaction is initiated, several pieces of information need to be recorded. Firstly, the person agreeing to the rental terms needs to be recorded. This may be a paying customer, a person acting on behalf of an organization (which is obligated by the rental contract), or it may be "customer" who is borrowing an item to do something for the foundation, such as a participant borrowing a costume to wear at the Colonial Heritage Festival. Secondly, the agent of the Foundation who works with the customer to make the rental needs to be recorded. Each rental needs to have the date the rental was made as well as the due date of the

items. All items rented on the same rental event will have the same due date. Additionally, each rental has a Discount Percent. When an item is being lent to a participant of an event such as the Colonial Heritage Festival, it is recorded as a rental with a 100% discount. Late fees and damage fees may still apply.

When an item is rented, there needs to be a way to note any significant damage or the general condition of the item so the customer is not held responsible for prior damage. Payment for the rental is received at the time of rental. In addition, credit card information may be taken if the customer is not a regular volunteer or otherwise known and trusted by the foundation; however, this information is kept in a paper file outside the information system.

Agents

An agent is a person who does something on behalf of the organization. Currently all agents are volunteers because the Foundation does not employ anyone, although the Foundation foresees a time when it will need employees—both salaried as well as hourly. So the person who checks out an item to a customer is an agent as is a participant or volunteer in the Colonial Heritage Festival.

Returns

The Foundation wants to know which of its agents checked in returned items. It also wants to know the date each item was returned. Typically, all items rented together are returned together, but this is not always the case. When an item is returned, there needs to be a way to record if it has sustained any new damage.

Late fees and damage fees

The standard daily late fee is 5 percent of the item's value. However, this may be reduced or waived at the discretion of the agent handling the return. When the item is returned, it is examined for damage and any damage fee is recorded at that point. Typically, these fees are collected at the time of the return; however, a return would be accepted without payment.

4. ONLINE SALES

A question that comes up with some degree of regularity at the events sponsored by the Foundation is whether items that are available for sale at a particular event can be purchased throughout the year. This question has been answered by saying that people can contact individual artisans to make arrangements but there is no centralized offering of products from multiple artisans.

The Foundation's board of directors has decided to set up an online store to provide an outlet for their artisans as well as to earn funds for ongoing operations. In addition to selling items produced by the artisans who participate in public events, the Foundation will purchase items appropriate for a colonial-era museum gift shop such as miniature replicas of the Liberty Bell and replicas of period spy-glasses.

Products

The general term for items offered for sale by the foundation is "product." Products that are made by artisans who work with the Foundation need to be identified separately from other items purchased for resale so that they can be promoted as "produced by the Colonial Heritage Foundation" as well as to provide biographical information about the artisan who produced the items. Products are grouped into categories for presentation in the online catalogue and each product may have several pictures, each of which has a caption.

Some items offered for sale in the store will be so similar that one set of pictures can be shown to represent any of the individual items sold. This is true of mass-produced items (such as the miniature Liberty Bells) as well as some artisan-produced products such as a particular style of mug made by the potter. The foundation refers to these as "bulk products." These are not tracked individually; rather, a "quantity on hand" of each kind of bulk product is maintained. Other items will be so unique and individual that the picture of the exact item should be shown when offered for sale; these are called "individual products". This is true of brooms as well as of large baskets. For individual products, the foundation wants to record that date it was made.

Still other kinds of items are made to order. For example, one of the artisans is a portraiture artist. He sells portraits made with quill and walnut ink on handmade paper. He works from a photograph to produce the final product. Similarly, the basket maker will make baskets according to customer specifications. The foundation refers to these kinds of products as "personal products". For each of these kinds of products, an item-specific order sheet is provided as a PDF file. It gives instructions on how to specify the details of the personal products. Finally, a phone number is required to accompany any order with personal product so the artisan can contact the customer directly if needed. While a phone number may be provided for any order, it

is only required for orders that include personal products. Each different kind of personal product should specify how long the customer should expect to wait for delivery, for example, two to four weeks.

Payment

Payment for orders will be accepted online by credit or debit card. Regular card information is taken at the time of the order but the payment is not processed until the item is ready to ship. For personal products, half of the price is charged when the order is accepted, the other half is charged when the product ships.

Shipment

Items held for sale are kept in a storage unit maintained by the foundation. Because the foundation expects sales to be slow at first, a volunteer will process orders only once a week. As sales increase, the foundation realizes that it may need to hire an employee to manage order fulfillment. In any case, the individual who handles different parts of the order fulfillment process needs to be recorded as well as when each step was completed. The steps are packing an order for shipment, charging a credit or debit card for the order and shipping the order. Both the carrier used and the tracking number needs to be recorded for each shipment.

4. RESOURCES

For more information on the Colonial Heritage Foundation and its activities, visit the following sites:

Main Foundation Site
http://colonialheritage.org

Colonial Heritage Festival
http://festival.colonialheritage.org

Colonial Heritage Festival Event Guide
http://goo.gl/duRpsO

Rebels and Redcoats
http://rebelsandredcoats.net