

Teaching Case

Kibbles & Bytes: Developing a Database for an Animal Shelter Silent Auction

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Hook

Whispering Hills's Animal Shelter recently held a successful, yet problematic, dinner and silent auction to raise funds for operations. Although the fundraiser attracted more attendees and item bidders than they had expected, the volunteer staff was ill-equipped to handle the onslaught of winning bidders at the end of the night. The shelter needs our help to transform their manual silent auction process into a more efficient and streamlined system.

Abstract

Many nonprofit organizations rely upon volunteers and fundraising events to supplement their operating budgets. Unfortunately, these budgets are often so tight that they do not allow for supplemental purchases beyond daily operations. Many nonprofit organizations would love to have volunteer help who could create software to meet their specific needs. However, many do not think to contact local universities for interns or class projects to help them with their needs. Thus, faculty looking for real-world projects to incorporate into their classrooms are often not aware of the needs in their community nor whom to contact. In this case, the students are asked to design and develop a database to support a silent auction fundraising event. System needs and requirements are presented in a conversational format simulating the client requirements interview process. The case can be used in a systems analysis and design, database development or graduate level management information systems course. The case focuses upon the development of donation management system for a small silent auction with donors, donations, and auction attendees. Multiple assignment options are provided allowing instructors to select an assignment based upon course material coverage. Suggested assignments include the development of process modeling diagrams such as data flow and swim lane diagrams, database design diagrams such as UML diagrams or ERDs, and database artifacts such as tables, queries, and reports.

Keywords: Teaching Case, Process Design, Swimlane Diagrams, Database Design, Silent Auction

1. INTRODUCTION

Nonprofit organizations face a multitude of compounding challenges including staying current with changing accounting and regulatory requirements, high employee and administrative turnover, increasing pet intake numbers, shrinking governmental funding, unsteady

income streams, shoestring budgets, and covering administrative costs (Alley Cat Allies, 2024; Matthews & Bloomberg, 2024). In addition, many nonprofits are located in communities where high numbers of the population earn below the median U.S. household income level (Alley Cat Allies, 2024). Thus, little, if any, money is available to allocate toward nonessential

administrative improvements and special projects. Hope for Paws, for example, an animal rescue facility in Los Angeles did not have the team capacity to implement traditional fundraising activities. They turned to social media and other resources to obtain needed financial support (Freewill, 2021).

Technical solutions are a means to fulfilling some of the needs and human resource shortfalls that nonprofits face. In this case, administrators at Whispering Hills Animal Shelter turn to the development of a silent auction database management system to streamline their annual fundraiser and silent auction, provide better tracking of donations, donors, and event attendees, and improve the overall accuracy and availability of silent auction data.

2. WHISPERING HILLS ANIMAL SHELTER

"What time did you get home last night?" Mark asked Lisa as she joined him at the kitchen table. Lisa was a member of the Whispering Hills' Animal Shelter advisory board. She had been in charge of the silent auction part of the big annual fundraiser they had the night before.

"Late," She sighed as she took a sip of her coffee. "I think I finally got home about midnight. It took us longer than we expected to collect the money and distribute the auction items. I also stayed and after the auction was over to help clean up."

"What was the hold-up?" Mark asked. "You thought you would be home by 10:00 p.m. at the latest when I left last night."

"We were slammed with everyone wanting to pick-up and pay for their silent auction items at the same time. We also had to smooth some ruffled feathers of some of our attendees. People got tired of having to stand in line and wait to have their bid sheets found and winning bid amounts due totaled, especially those who were at the back of the line. I'll bet those folks at the back of the line had to wait for over an hour and a half!

We really need to get the process fixed before next year's fundraiser. It earns a big chunk of the shelter's budget. I'm wondering if there is some way we can automate it? I'm supposed to have lunch with my friend, Sandy, today. I'm going to see if she can help."

3. A WORKING LUNCH

Sandy was an MBA student at the local university. She and Lisa had become friends while working on a database project for a community conference for local teen girls. Sandy had diagramed the steps in the conference registration process to find bottlenecks in the procedures as well as designed and developed a registration database for the conference. As the waiter walked away from their table with their order, Sandy asked Lisa, "Tell me about last night's fundraiser. Did it do as well as you had hoped?"

"Overall" Lisa started, "it was one of the most successful fundraising events we have ever had. We had more attendees and auction items than we have had at any of our other events. We also were able to raise more money than we expected. However, we weren't prepared to handle everyone when they were ready to pay for their items at the silent auction. So, I'm hoping it doesn't turn people off from coming next year."

"What was the problem?" Sandy asked. "I'm not really familiar with your event or what a silent auction is, so you'll have to tell me that as well."

The Fundraiser

"For the past two years," Lisa began, "Whispering Hills Animal Shelter has held a dinner and silent auction to raise funds to help with shelter operational expenses. It was new last year, so we did not have many attendees. However, this year we had an entertainer perform. We also made a concerted effort to get the word out which resulted in the sale of about 250 tickets for this year's event. People purchased tickets at the shelter or from one of our community partners, so we didn't collect any information about attendees before the day of the event. Besides the catered meal and entertainment, we also had a silent auction, our big money maker.

The Silent Auction

A silent auction contains items donated, mostly by businesses, for people to bid on. Some of the items are gift certificates to be used at the different businesses for items such as pizza, hotel rooms, or oil changes. However, there are also some tangible items for auction as well, such as gift baskets, sports memorabilia, or hand-crafted pieces of art that people can see and touch. The gift certificates and items are displayed on the tables with their bid sheets before the event begins. (Figure 1.)

4. THE DATABASE

Pre-Event

"I'm thinking that we could have all of the auction donor and item data entered into a database before the auction starts," Lisa began. "We could also enter all of the attendee registrations into the database as people prepurchase tickets. An attendance list could be printed before the event to check people off as they arrive and to assign bid numbers. For those people purchasing tickets at the door, we could enter their data directly into the database the night of the event. Data that we would collect would be things like their name, address, phone number, email address, bidder ID, and preferred means of contact for the night of the event.

Night of the Event

At the end of the evening, we can pick up all of the bid sheets, enter the winning bid number and amount for each item into the database, run a report listing all of the winning bid numbers and amounts, and then post that report list as a web page on the shelter's website. People could go to the web page to see what they won as well as the amount owed for each item. It would also be nice if individual reports could be generated for each winning bidder listing the items that they won as well as the total amount they owed and sent out to each winner as an email or text message with information for our online payment system. They could then pay for their items electronically before they get to the check-out table and just show us the receipt on their phone and pick up their items.

Post Event

Once we have an attendee's information collected, we can use that data to send communications to them in the future. We can also just update that information for future auctions so that person will not have to go through the process of filling out a registration form every year. They would, however, have to be assigned a new bidder ID every year."

"You had mentioned collecting donor data too. What do you have in mind?" Sandy asked.

Donor Data

"Besides from the data used to describe each item," Lisa started, "we would also want to collect data about each of the donors for each of the items so that we can send them a thank you note and a receipt detailing their charitable contribution for their tax records.

The kind of information that we would want to collect about each donor would include the donor's name, contact name, street, city, state, zip code, email address, work phone, and cell phone. We would also assign each donor an ID for our database.

For each donated item, we will need to know the name of the item, a description of the item, the item's value, an expiration date for the item if applicable (gift certificates usually have an expiration date), and we will assign the item an ID. Donors often provide more than one item, so each individual item would need to have an item ID. We also hope each donor will donate items for future auctions, so we will need to be able to associate each year's auction item to the appropriate donor.

Of course, protecting the data is paramount. The database would need to contain safeguards to not only keep the data safe, secure, and free of errors, but we would also want to ensure the privacy and protection of donor and attendee data.

5. REPORTS

"I think you have already touched on this a bit, but what kind of reports would you like to be able to run with your database?" Sandy asked.

Event Reports

"Well," Lisa started, "I have already mentioned a couple of reports that we need for the end of the evening. We would like a list of winners that will be posted as a web page that will include the item IDs, item names, bidder IDs, and the winning bids. We would also like to be able to send an individual message out to each person at the end of the night indicating the item(s) that they won and the total amount they owe. That message would act as a receipt, so it would be nice if we could list the bidder ID, the item IDs, item names, each amount owed, and then total the entire amount owed for that person.

Donor Reports

We will also want to be able to send a report to each donor listing each of the items that they donated including the item ID, item name, item description, item category, value of the item, number of items donated, and total value of items donated. As we prepare for future auctions, it would be nice to be able to run a list of past donations as well as a list of donor names, contact names, addresses, phone numbers, and list of items donated so that when one of our volunteers

solicits items for future silent auctions, they will have an idea of who has donated to us in the past and what they provided.

Attendee Reports

It would be nice to have an attendance list for the night of the event so that we can check people off as they arrive. We would also like to be able to send communications to attendees as well. For instance, it would be nice to send an email reminder out to ticket holders to remind them about the event and start generating enthusiasm for the auction. It would also be nice to send an email out to all attendees after the event thanking them for their support of the event and notifying them of upcoming shelter events. Thus, we will want to be able to send personalized notices to emails that will include the person's name and email address."

Wrapping Up

"You've put a lot of thought into this." Sandy noted as the waiter brought their lunch order to their table. "Let me start working on this for you to see if we can come up with a solution. I want to start by drawing out the processes to make sure I understand what is being done, the data that needs to be collected, and the reports that need to be generated. This will help me to see if I am missing anything. I'll try to send you some diagram and report mock-ups by the end of the week."

6. ASSIGNMENTS

This project could take multiple paths depending on the role and activities your instructor has in mind for you. Clarify with your instructor the role that you will play.

Process Model Diagrams

Assume the role of Sandy, the MBA-student. Draw out the functional process steps to verify that you have identified all of the steps and understand how the process works.

1. Create diagrams modeling each of the processes.
2. Write short narratives to accompany your diagrams to verify and support your interpretation of the process.
3. Once the narratives are written:
 - a. Compare the narratives to the diagrams to identify and/or clarify missing steps in the process.
 - b. Compare the narratives to the actual description in the case to identify missing steps in the diagram or areas needing clarification.

4. As the diagrams are developed, record any assumptions or interpretations you make, regarding the processes, in a separate document.

Data Flow Diagrams

Assume the role of Sandy, the MBA-student. Create a data flow diagram to illustrate the flow of data through the silent auction management process to verify that you understand how the data is collected, processed, stored, and disseminated.

1. Create a diagram modeling the flow of data through the process.
2. Write a short narrative to accompany your diagram to verify and support your interpretation of the process.
3. Once the narrative is written:
 - a. Compare the narrative to the diagram to identify and/or clarify missing steps in the process.
 - b. Compare the narrative to the actual description in the case to identify missing steps in the diagram or areas needing clarification.
4. As the diagrams are developed, record any assumptions you make, regarding the processes, in a separate document.

Systems Analysis Design and Database Development

Assume the role of Sandy, the MBA-student. You want to build the database. You want to:

1. Accumulate the functional and technical requirements for the system.
2. Prioritize the requirements.
3. Create system development diagrams.
4. Create a data dictionary.
5. Create data entry forms.
6. Create queries to generate records needed for event attendance; lists of donors, donated items, and winning bids; and data needed for various mail-merged emails (e.g., item donors, bid winners, thank you letters. and general communication).
7. Create reports for the queries including event attendance, donor, donated items, and winning bids lists and informational emails and letters to donors, attendees, and winning bidders.
8. Incorporate privacy, security, and data error handling measures throughout the database. Include a brief written report describing:
 - a. the measures that were taken,

- b. the data those measures will protect, and
 - c. how they will protect the data.
9. As the database is developed, record any assumptions made in a short report.

Future System Enhancements

Once the initial system has been developed, future updates can be made to further enhance its capabilities such as:

1. Automation of reports and messages,
2. Real-time updates of bidding progress,
3. Enhanced privacy and security measures,
4. Integration with other systems,
5. Scalability, and
6. Data analytics.

Students may want to:

1. Write a short narrative explaining how one or more of the capabilities could be incorporated into their system and the value they would provide to the organization.
2. Incorporate one or more of the capabilities into your system.

7. POTENTIAL CHALLENGES & OBSTACLES

System Complexity

From a macro level perspective, the silent auction system may initially seem quite complex. However, focusing on the individual separate subprocesses such as registering donors, recording donated items, registering attendees, entering winning bids, etc. will help to simplify the complexities of the system.

Time Management

Projects normally take longer than one would expect. Breaking the project down into small goals to be completed over a period of time will allow time for asking the instructor questions that may arise.

Diagrams and Symbols

Should a student be unfamiliar with business process mapping or data flow diagrams, there are

many resources available online that describe the diagrams and provide examples of the diagrams and their symbols including:

- Creately Business Process Modeling Techniques with Examples: <https://creately.com/blog/bpm/business-process-modeling-techniques/>
- Asana's Guide to Process Mapping Process Mapping <https://asana.com/resources/process-mapping>
- The tutorials associated with business modeling software such as Lucidchart, draw.io, smartdraw.com, and Visio.

8. CONCLUSION

Sandy worked all week formalizing her ideas. When she and Lisa met to discuss her database vision, diagrams, and mock-ups, Lisa was pleased with her work and encouraged her to start working on the project as soon as possible. Examples of some of the report mock-ups can be found in the appendix.

9. BIBLIOGRAPHY

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APPENDICES

List of Winners Report

Whispering Hills Shelter Silent Auction

Thank you so very much for your attendance and participation in the annual Whispering Hills' Animal Shelter silent auction. Below is the list of winners and their winning bids for each item.

	Item ID	Item Name	Bidder ID	Winning Bid Amount.
1	D24000	SMC – Gift Cert. \$100	112	\$90
2	D24001	SMC – Gift Cert. \$ 50	206	\$45
3	D24002	SMC – Gift Cert. \$250	176	\$245
4	D24004	Schwinn Bicycle	54	\$345
5	D24009	Movie Theater Tkts - 4	96	\$30
...				
...				
199	D24250	WalMart – Gift Card \$25	112	\$25
200	D24251	KFC – Gift Card \$25	229	\$25

Winning Bidder Email Receipt Report Example

Whispering Hills Shelter Silent Auction

Bid ID: 112
Amanda Gomez
219 Rosewater Lane
Whispering Hills, MO 63901

Thank you so very much for your attendance and participation in the annual Whispering Hills' Animal Shelter silent auction. The Shelter would not be able to continue without supporters like you. We are so grateful for you and your generosity. Listed below are the items that you won. Please pay electronically at your seat before the evening ends or write a check to the Shelter to have ready at checkout. Winning items will be available at checkout by last name.

	Bidder ID	Item ID	Item Name	Winning Bid Amount.
1	112	D24000	SMC – Gift Cert. \$100	\$90
2	112	D24015	CFA – Gift Cert. \$25	\$25
3	112	D24016	Culver's – Gift Card \$25	\$25
				\$140

For questions, please contact the office at (555) 555-2222.

Sincerely,

Lisa

Whispering Hills' Animal Shelter

Tel (XXX) 555-2222 100 Shelter Lane
Fax Fax (XXX) 555-2223 Whispering Hills, MO 63901

Letter to Donors Report Example

Whispering Hills Shelter Silent Auction

Amber Smith
Smith Motor Company
115 Automotive Lane
Whispering Hills, MO 63901

Thank you so very much for your donation to the annual Whispering Hills' Animal Shelter silent auction. This fund raiser is critical to funding our yearly operations and covers almost 20% of our annual budget. The Shelter would not be able to continue without supporters like you. We are so grateful for you and your generosity. Listed below are the items that we have listed as your donation. If you see a mistake, please let us know. If the item still needs to be delivered to the shelter office, please let us know and we will be glad to make arrangements with you at your convenience.

ItemID	Item Name	Item Description	Category	Value	# of Items Donated	Total Value
D24000	SMC – Gift Cert. \$100	Gift Certificate for Vehicle Detailing	Gift Certificate	\$100	2	200
D24001	SMC – Gift Cert. \$50	Gift Certificate for Oil Change and Car Wash	Gift Certificate	\$50	4	200
D24002	SMC – Gift Cert. \$250	Gift Certificate toward new tires or vehicle Maintenance	Gift Certificate	\$250	1	250
Total					5	\$650

For questions, please contact the office at (920) 555-2222.

Sincerely,

Lisa

Whispering Hills' Animal Shelter

Tel (920) 555-2222 100 Shelter Lane
Fax Fax (920) 555-2223 Whispering Hills, MO 63901

List of Donations Report Example

Silent Auction – 2024 Donations

ItemID	Item Name	Item Description	Category	Value	# of Items Donated	Total Value
Smith Motor Company, 115 Automotive Lane, Whispering Hills, MO 63901						
Contact: Amber Smith (920) 123-4577. Email: asmith@smithmotor.com						
D24000	SMC – Gift Cert. \$100	Gift Certificate for Vehicle Detailing	Gift Certificate	\$100	2	200
D24001	SMC – Gift Cert. \$50	Gift Certificate for Oil Change and Car Wash	Gift Certificate	\$50	4	200
D24002	SMC – Gift Cert. \$250	Gift Certificate toward new tires or vehicle Maintenance	Gift Certificate	\$250	1	250
Chick-Fil-A, 225 Restaurant Lane, Whispering Hills, MO 63901						
Contact: Jason Stevens (XXX) XXX-XXXX. Email: jstevens@whmca.com						
D24014	CFA- Birthday Party	Gift cert. for Bday Party for 10 kiddos (\$150)	Gift Certificate	\$150	1	\$150
D24015	CFA- Gift Card \$25	Gift card for CFA - \$25	Gift Card	\$25	4	\$100
Mike's Bikes, 165 Sports Road, Whispering Hills, MO 63901						
Contact: Mike Waters (XXX) XXX-XXXX. Email: mike@mikesbikes.com						
D24004	Schwinn Bike	Red children's bike	Item	\$350	1	\$350

Silent Auction Item Donor Information List

	Donor ID #	Name	Phone	Email	Address	Communication Preference
1	D24001	Alex Turner	(920) 123-4567	alex.turner@email.com	123 Cardinal Ave, MO	Text
2	D24002	Samantha Wells	(920) 123-4568	s.wells@email.com	456 Vine St, MO	Text
3	D24003	Michael Roberts	(920) 123-4569	m.roberts@email.com	789 Artisan Way, MO	Phone
4	D24004	Jessica Franklin	(920) 123-4570	j.franklin@email.com	101 Dells Rd, MO	Text
5	D24005	Daniel Gonzalez	(920) 123-4571	d.gonzalez@email.com	202 Gourmet Blvd, MO	Text
6	D24006	Olivia Peterson	(920) 123-4572	o.peterson@email.com	303 Movie Hall Rd, MO	Text
7	D24007	Ethan Clark	(920) 123-4573	e.clark@email.com	404 Chef St, MO	Text
8	D24008	Ava Johnson	(920) 123-4574	a.johnson@email.com	505 Serenity Ln, MO	Text
9	D24009	Lucas Martinez	(920) 123-4575	l.martinez@email.com	606 Tech Dr, MO	Text
10	D24010	Emma Thompson	(920) 123-4576	e.thompson@email.com	707 Canvas Rd, MO	Phone
11	D24011	Smith Motor Company	(920) 123-4577	asmith@smithmotor.com	115 Automotive Lane, MO	Text

Silent Auction Attendance List

	Attendee ID #	Name	Street	Zip Code	Email	Phone
1	A24001	John Doe	123 Maple Drive	54321	johndoe@email.com	(920) 456-7890
2	A24002	Jane Smith	456 Oak Lane	54322	janesmith@email.com	(920) 456-7891
3	A24003	Emily Johnson	789 Pine Street	54323	emilyjohnson@email.com	(920) 456-7892
4	A24004	Michael Brown	101 Birch Road	54324	michaelbrown@email.com	(920) 456-7893
5	A24005	Jessica Davis	202 Cedar Blvd	54325	jessicadavis@email.com	(920) 456-7894
6	A24006	William Martinez	303 Redwood Ave	54326	williammartinez@email.com	(920) 456-7895
7	A24007	Sarah Wilson	404 Spruce Way	54327	sarahwilson@email.com	(920) 456-7896
8	A24008	David Anderson	505 Elm Street	54328	davidanderson@email.com	(920) 456-7897
9	A24009	Amanda Thomas	606 Walnut Road	54329	amandathomas@email.com	(920) 456-7898
10	A24010	James Jackson	707 Chestnut Drive	54320	jamesjackson@email.com	(920) 456-7899

Silent Auction Items List

	Item ID #	Item Name	Description	Category	Expiration Date	Value	Quantity	Total Value
1	D241000	SMC – Gift Cert. \$100	Gift certificate for vehicle detailing	Gift Certificate	1/1/2025	\$100	2	\$200
2	D241001	SMC – Gift Cert. \$50	Gift certificate for oil change and car wash.	Gift Certificate	1/1/2025	\$50	4	\$2000
3	D241002	SMC – Gift Cert. \$250	Gift certificate for toward new tires or vehicle maintenance	Gift Certificate	1/1/2025	\$250	1	\$250
4	D241003	Autographed Football	A football signed by players from the Whispering Hills Baseball team, perfect for sports fans.	Item	NA	\$150	1	\$150
5	D241004	Schwinn Bike	Red Schwinn Children's Bike	Item	NA	\$350	1	\$350
6	D241005	Vintage Wine Set	A set of three vintage wines from renowned vineyards, aged to perfection.	Item	NA	\$300	1	\$300
7	D241006	Artisan Jewelry Box	Handcrafted wooden jewelry box with intricate designs, made by a local artist.	Item	NA	\$200	1	\$200
8	D241007	Weekend Getaway	Two-night stay at a luxury cabin in the scenic Whispering Hills.	Gift Certificate	1/1/2025	\$400	1	\$400
9	D241008	Gourmet Dinner	A private chef experience for four, featuring a custom menu.	Experience	1/1/2025	\$500	1	\$500
10	D241009	Movie Tickets - 4	Four VIP tickets to a movie at Whispering Hills Movie Theater	Gift Certificate	3/15/2025	\$30	3	\$30
11	D241010	Cooking Class	A group cooking class led by a celebrity chef, includes meal and beverages.	Experience	1/1/2025	\$250	1	\$250
12	D241011	Yoga Retreat	A weekend yoga retreat package at a serene wellness center.	Experience	1/1/2025	\$350	1	\$350
13	D241012	Tech Gadget Bundle	The latest tablet, smartwatch, and wireless headphones, all in one package.	Item	NA	\$800	1	\$800
14	D241013	Original Painting	An original canvas painting by a prominent local artist, a collector's item.	Item	NA	\$450	1	\$450
15	D241014	CFA- Birthday Party	Gift Cert. for Bday Party for 10 kiddos (\$150)	Gift Certificate	1/1/2025	\$150	1	\$150
16	D241015	CFA- Gift Card \$25	Gift card for CFA - \$25	Gift Card	NA	\$25	4	\$100
17	D241016	Culver's–Gift Card \$25	Gift card for Culver's - \$25	Gift Card	NA	\$25	4	\$100