

## Teaching Case

# A Registration System for a Citywide Service Project: Design & Development Case

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### Hook

Baker Street Church is faced with an unexpected yet wonderful problem. Recent publicity has turned their small service activity into a community-wide event rendering their volunteer management system obsolete. They are seeking help in developing a database that can handle their growing list of projects and volunteers.

### Abstract

Many small organizations sponsor events and activities that could benefit from the data management and reporting capabilities provided through a centralized database. However, many of those organizations do not have the budget to afford a commercial solution or an on-going subscription to a cloud-based solution for a small scope event with limited frequency use. The case focuses upon a service project volunteer management system for recording, managing, and reporting on volunteers and the service projects they are doing. The case provides a realistic scenario that can be used in a systems analysis and design, database development, or graduate level management information systems course. 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 a data flow or swim lane diagrams and database design and development artifacts.

Keywords: Teaching case, Database design, Process design, Swimlane diagrams

### 1. CASE SUMMARY

Baker Street Church in Whispering Hills, Missouri, **is hosting their second annual "Day of Blessings"** event for the community. The outpouring of interest has been more than they had anticipated. They are facing the impossible task of matching a mountain of volunteers to an equally overwhelming pile of service projects. The event has outgrown the capabilities of their spreadsheet and sticky-note matching process that was used the previous year. They seek the assistance of a local MBA student to help them develop a database solution to fill the gap.

### 2. CASE TEXT: A GOOD PROBLEM TO HAVE

Mike Green, pastor of Baker Street Church in Whispering Hills, MO, stared at the unending list of new email in his Outlook In box. The deadline **for submitting service project ideas for their "Day of Blessings" initiative was hours away and the** thought of matching the community projects and needs with volunteers was daunting.

The Day of Blessings initiative was relatively new. The event got off to a slow start the previous year, so he was not expecting much of a turnout this year either. However, a local personal **interest story, with roots in last year's initiative,**

was making current news headlines and the outpouring of interest was overwhelming. The church phone lines had been ringing nonstop with people suggesting projects to do and volunteers wanting to **help with this year's event.**

His thoughts were interrupted by a knock at the door. Jenny, the church administrative assistant, **had a stack of papers and messages.** "Mike," she said, "you kind of have that 'deer-in-the-headlights' look about you. I think what I'm about to give you is just going to add to it."

"More projects?" Mike asked as he motioned for Jenny to come in and be seated.

"Yes, more projects AND volunteers," Jenny said emphasizing the 'and' in her reply. "It's a good problem to have."

"I totally agree with you on that," Mike said, "but matching all of the people to the projects without accidentally leaving something or somebody out is going to take more time than we have available. I don't know how we're going to be able to get it done. Last year, we had a small stack of projects and volunteers. We were able to use spreadsheets and different color sticky notes to **get projects and people matched. I don't think it will be that simple this year.** With that many people involved, we're going to have to do a lot more communicating, generating reports, and handling logistical issues. It would be nice if we had some sort of registration and reporting system to help us with this project. I'm sure there are some out there, but we don't have time to go through the budget approval process to get the money approved to research, purchase, learn, and setup a new system **before the big event.**"

Jenny thought for a moment and offered, "There's a new MBA student in our class for college-aged students who stopped by the church office the other day. He asked if there were any computer-type requests in the list of Day of Blessings projects that he could volunteer to do. I took down his name and number and told him I would **get back to him. I'll give him a call to see** if he can help us with this. I can check your schedule and arrange a meeting if it sounds like something **he can do.**"

### 3. THE MEETING

Jenny was able to arrange a meeting with David, the new MBA student, for early the next day. David arrived at Mike's office ready to take notes. "Pastor Mike," David said as he stuck out his hand in greeting, "it's good to see you today. This

**project came just at the right time! I'm supposed to design and build a database for my management information systems course at school. The deadline to submit a project idea is almost here. What Jenny told me about the system you are needing sounds like it will work for my project. Could you go over the steps of the process and the data needs with me so that I can take notes to figure out what you need and to put something together to turn in for my class?"**

"Of course, David," Mike said as he motioned towards a chair in his office. "I hope this works out for both of us. Just to give you a little background, last year was the first time that we ever hosted the Day of Blessings event. With all of the hard things going on in our community, we thought it would be good to do something nice for everyone and to try to bring the community together a bit. Although the event involves people of all ages performing community service projects over an eight-hour period of time on a Saturday, **there's a lot of work that takes place behind the scenes in planning, coordinating, and carrying out the event.**"

#### Service Project Examples

"In preparation for the upcoming service day," Mike said, "we ask the church congregation if they are aware of, or have any ideas for, service projects that we can do as a church. We also contact various local organizations and agencies to see if there are any projects that they might have for us to do too."

"Organizations are welcome to submit more than one project. Some examples of projects that we did last year include purchasing and installing playground equipment at a local private school, painting a mural in the play area of a local public school, helping an older couple in church paint their house, building a ramp for a person who would soon be coming home from the hospital, making and delivering food baskets in a lower income area of town, taking lunch to our local fire department, and buying gift cards for our local police station."

"The projects range from needing just a couple of people with any skill level to multiple people with specific skills. We also have a certain amount of money allocated in our church budget to pay for the supplies needed for the event activities, so we **try to stay within our budget.**"

#### Service Project Data

"As you would guess," Mike continued, "in order to carry out all of those service projects, there's a lot of data that we have to collect about the

activity besides the service project name and description. We also need to have a contact name with contact information such as the organization, email, phone, and address; the address at which the activity will take place; the amount of time the project will require; the number of people needed to perform the project; the skills needed to perform the project; the supplies and quantity needing to be purchased for each project; project supplies provided that will not need to be purchased; the actual cost and number of supplies purchased for each project; the date the supplies were purchased; and the estimated amount of time needed for the project with the requested people."

"Bob, the Facilities Director, and I will use the supply list report to purchase all of the supplies before the big day. We will need to record the date when purchases are made, the quantity of each item purchased for each project, and the amount paid. We should also include the name of the vendor from whom the supplies were purchased so that we will have this information to reference if something needs to be returned and for future supplies. Once the purchases are made, I will give the receipts to Jenny, and she will be able to enter the purchase details into the system and store the receipts in the folder she keeps for this event."

#### Volunteer Data

"In order to carry out all of those projects," Mike said, "we need to have volunteers. Last year, we created a catalog of projects including the project name, description, location, contact, estimated time commitment, as well as the number of people needed. The catalog was posted to the church's website along with a downloadable form that volunteers could fill out and give to the church office with the name of the project they were interested in, special skills they offered, their name and address information, gender, age category, volunteer type (church or community member) as well as their willingness to take the lead on a project. Due to the short timeframe in which our projects were completed, volunteers could only sign up for one project. That restriction applies for this year too.

"We didn't have a lot of projects or volunteers last year, so we just created a spreadsheet for each project and volunteer list and kept them at the lobby welcome desk.

"We didn't know what to expect this year. We anticipated a little growth, but nothing like what we are experiencing. Thanks to the local media, this year is a different kind of animal. Last year,

one of our service projects involved repairing the roof of an unemployed single mother and helping her get some bedroom furniture for her kids. After getting to meet her and learn of her plight, one of the volunteers hired her to work at his business. She has just blossomed in her role with the company. During a 'person on the street' interview about the current state of the economy by the local news media, she told them her story and now it seems like the entire community wants to get involved helping others. Thus, our need for a database."

"I see," David paused and then jotted down more notes. "What kind of reports do you think you'll need throughout the process?"

#### Reports

"Well," Mike replied, "the first type of report we will need is the catalog of service projects so that we can make everyone aware of the projects available and their details. Speaking of projects, we would also need to have a 'shopping list' providing a compilation of all of the supplies that need to be purchased for each of the projects before the day of the event. This would need to be printed in order of supplies needed as well as include the name of the project for which it will be used. On the day before the event, we could use that same report as a check-off sheet to make sure that each project had the supplies.

"We would also need a volunteer list for each of the projects so that we would have the names, phone numbers, and age category of the volunteers. We would also want to include the project leader on that sheet. The report would have to be printed in order of project. Also, on the day of the event, we could use that report as a check-in sheet so that we can make sure that each project has enough people and to get them into the right groups.

"A project summary sheet containing the project names, a description of each project, the location of the activity, the contact for that activity, and the contact's phone number would also be beneficial. The event coordinators would need these sheets so that they could get in contact with specific groups and individuals. I can give you copies of the reports that we had last year" (Appendix A).

#### Communication

"With the event being so new and small last year," Mike continued, "communicating lists and event details was fairly easy. However, there are going to be a lot more people involved in the event this year, both in and outside the church.

**I'm going to have to send more specific emails targeted towards each project. It would be great if the database could send an email 'report' to project leaders with the information about their event and the contact information for the people signed up for their activity. I could send that email out two or three times before the event. You may be able to think of some other emails or reports that would be helpful, but those are the ones that come to mind."**

#### Equipment Needed

David thought for a moment and then asked, **"Since obtaining the funds to purchase a new database system is going to be a problem, will you have the resources to actually run the database before and during the event?"**

Mike took a sip of his coffee before answering. **"I've already been thinking about that. The children's program has grown significantly over the past few years. We anticipated upgrading the computers in the children's check-in process this year and \$6000 was allocated in the budget to purchase three new laptops, two tablets, a printer, and any additional hardware required. I think we could go ahead and purchase the new equipment and use it for the Day of Blessings. Once we are done with the equipment, it can be installed in the children's check-in area. Since both processes focus upon checking people in, the memory, storage, and speed requirements should be similar.**

**"With so many people expected to be involved in the Day of Blessings event this year," Mike continued, "we are going to have to have multiple event day check-in areas set-up. We'll probably have to set up three standalone tables each with a laptop in the north parking lot. Two of the tables will handle event day walkup registrations. The third table will be the 'command center' table to handle registration problems and printing extra reports, so this table will also need a printer. To move people with advanced registrations through the event day check-in process more quickly, we will have two lanes on the parking lot where people can check in while sitting in their cars. A volunteer with a tablet will go from car to car checking people in. Since we will be in the parking lot, we will also need some sort of mobile internet access. Do you have any hardware recommendations that you could make for us?"**

#### Wrapping Up

**"Not off of the top of my head," David said as he continued writing notes, "but, I'll see what I can find to recommend. I'll also see if I can find a commercial volunteer management system,**

**similar to what you are wanting, so that you can see what data they collect and reports they run. I know you are unable to buy it at this time, but it may give us some ideas. I would like to create data flow and process models of what I think you are seeing your data collection and reporting processes looking like so I can make sure we are on the same wavelength. I'll try to send you something by the end of the week."**

#### 4. ASSIGNMENTS

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

##### Request for Proposal (RFP)

Assume the role of David, the MBA student and conduct an Internet search to find a commercial volunteer management system that will fit the **church's need for the Day of Blessings event**. Mike is ready to acquire and implement the commercial system. His first step is to solicit vendor bids to obtain the technical infrastructure to support the new system.

1. From **the church's** perspective, develop the functional and technical requirements that would be included in a request for proposal (RFP).
2. **From a potential vendor's perspective, develop the vendor's response to the RFP** for the technical requirements. Essentially, you are proposing the hardware, software, networking, installation, documentation, and training that will be required to implement the infrastructure.
3. As the documents are developed, record any assumptions you make, regarding the processes, in a separate document.

##### Process Model Diagrams

Assume the role of David, the MBA student and 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 processes.
3. As the diagrams are developed, record any assumptions you make, regarding the processes, in a separate document.

### Data Flow Diagrams

Assume the role of David, the MBA student and create a data flow diagram to illustrate the flow of data through the volunteer 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. 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 David, the MBA student. Mike does not have the budget to purchase a commercial volunteer management system. He wants you to build the database. He wants 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 service project clients; service project descriptions and resources needed; available volunteers; service project volunteer lists; resource shopping lists; and data needed for various mail-merged letters (e.g., thank you letters).
7. Create reports for the queries including service project client information lists, service project opportunity descriptions and resource needs lists, available service project volunteer lists; resource shopping lists; and informational letters to service project clients and thank you letters to volunteers.
8. As the database is developed, record any assumptions that you make in a short report.

### 5. CONCLUSION

David worked all week developing and clarifying **the diagrams. He watched Pastor Mike's face** expectantly as he explained the diagrams and his vision for the database. A slight grin began to stretch **across Mike's face as David finished explaining his last diagram.** "David," Mike breathed, "That's great! I think you know exactly what we are needing. I can't wait to start using your new database!"

Appendix A

**Day of Blessings Project List**

Date: 8/02/2022

Project ID	Project Name	Description	Supplies	Street	Number of People Needed	Start Time	Time Estimate	Contact	Contact Phone Number
P22001	Yard cleanup	Remove leaves, sticks, & dead plants, mow yard, trim bushes, and use weed eater for elderly person.	Need to bring equipment.	115 Park St.	5	9:00am	4 hours	Mark Wilson	###-###-####
P22002	Exterior house painting	Paint exterior of house one color.	Paint and brushes provided.	115 Park St.	8	9:00am	8 hours	Mark Wilson	###-###-####
P22003	School mural painting	Fill in mural outline on front parking lot of school.	Paint and supplies will be on site.	Whispering Hills Elementary School	5	9:00am	6 hours	Jane Wynn	###-###-####
P22004	Park arts & crafts	Design arts and crafts to entertain children 6 to 9.	Project lead will purchase art supplies and snacks.	Whispering Hills Park Pavilion #5	6	8:30am	2 hours	Scott Brown	###-###-####
P22005	Drywall repair	Replace drywall on one basement room that had water damage.	Supplies will be on site.	219 Oak St.	3	9:00am	5 hours	Alex Anderson	###-###-####
P22006	Park cleanup	Remove sticks and trash from park.	Rakes, trash bags and gloves will be on site.	Whispering Hills Park	15	9:00am	5 hours	Jason Stevens	###-###-####
P22007	Roof repair	Repair storm room damage.	Supplies will be on site.	877 Sunshine St.	5	9:00am	4 hours	Brian Jackson	###-###-####

**Day of Blessings Project Shopping List 2022**

Date: 7/28/2022

Project ID	Project Name	Description	Supplies	Price Estimate Each	Quantity	Need to Purchase
P22001	Yard cleanup	Remove leaves, sticks, & dead plants, mow yard, trim bushes, and use weed eater for elderly person.	Recyclable trash bags	\$1	10	Y
P22002	Exterior house painting	Paint exterior of house one color.	Paint Brush – 4"	\$6	4	Y
P22002	Exterior house painting	Paint exterior of house one color.	Paint Brush – 2"	\$4	2	Y
P22003	School mural painting	Fill in mural outline on front parking lot of school.	Paint Brush – 2"	\$4	3	Y
P22002	Exterior house painting	Paint exterior of house one color.	Paint Brush – 1"	\$2	2	Y
P22003	School mural painting	Fill in mural outline on front parking lot of school.	Paint Brush – 1"	\$2	4	Y
P22002	Exterior house painting	Paint exterior of house one color.	Painters' Tape – 1" width	\$6	2 rolls	Y
P22003	School mural painting	Fill in mural outline on front parking lot of school.	Painters' Tape – 1" width	\$6	2 rolls	Y
P22002	Exterior house painting	Paint exterior of house one color.	Paint– White Exterior	\$60	4 gal	N

## Day of Blessing 2022

7/28/2022

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Amber Smith  
115 Park St.  
City, State ZIP

Thank you very much for serving as Project Lead on the Arts and Crafts activity for 6- to 9-year-olds for the Day of Blessing event. The activity will take place in pavilion #5 at Whispering Hills Park. Please be set up no later than 8:30 a.m. with children expected to arrive by 9:00 a.m. Please purchase the art supplies you need for the activity as well as snacks for 20 children. Listed below are the people who volunteered to help with your event.

	Volunteer Names	Phone	Email	Age
1	Sue Wilson	xxx-xxx-xxx	xxxxx@xxxx.com	Adult
2	Jake Wilson	xxx-xxx-xxx	xxxxx@xxxx.com	Adult
3	Lindsey Adams	xxx-xxx-xxx	xxxxx@xxxx.com	Teenager
4	Lisa Adams	xxx-xxx-xxx	xxxxx@xxxx.com	Teenager
5	Jamie Wilson	xxx-xxx-xxx	xxxxx@xxxx.com	Teenager
6	Matt Wilson	xxx-xxx-xxx	xxxxx@xxxx.com	Teenager

For questions, please contact the church office at (555) 555-1112.

Sincerely,  
Mike

### Baker Street Church

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Tel (XXX) 555-1111      100 Baker Street  
Fax Fax (XXX) 555-1112      Whispering Hills, MO 63901

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## Day of Blessings Project / Volunteer List

Date: 8/02/2022

Project ID	Project	Contact	Volunteer Name	Age Category	Phone
P22001	Yard Cleanup	Mark Wilson	Mark Wilson	Adult	XXX-XXX-XXXX
P22001	Yard Cleanup		Andrew Martin	Adult	XXX-XXX-XXXX
P22001	Yard Cleanup		James Wilson	Teenager	XXX-XXX-XXXX
P22001	Yard Cleanup		Raina Wilson	Teenager	XXX-XXX-XXXX
P22001	Yard Cleanup		Terri Smith	Adult	XXX-XXX-XXXX
P22002	Exterior House Painting	Mark Wilson	Jane Wilson	Adult	XXX-XXX-XXXX
P22002	Exterior House Painting		Jenny Anders	Teenager	XXX-XXX-XXXX