

Teaching Case

System Design and Development of a Special Population Resource Placement System Case

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Abstract

Due to a job transfer, Lisa and Mark Williams recently moved to Whispering Hills with their two daughters. Frustrated with a lack of information about area special needs resources, Lisa set out to develop a centralized repository for area resources and opportunities for individuals with special needs and their families. Through conversations with a friend from home who oversaw such a service, information is gathered to provide the requirements to create the database that Lisa has in mind. 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. The case focuses upon the development of a database to provide a support system for connecting care givers of loved ones with special needs with people in similar circumstances, volunteers, social and employment opportunities. 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, a request for proposal and a response to the request for proposal, and database design and development artifacts.

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

1. INTRODUCTION

Lisa Williams stared vacantly at the picture of her daughter's friends in the scrapbook on her lap. Yes, she missed their old house and friends in Pine Bluff, but she especially missed the opportunities that were available for young adults with special needs. She, her husband, and two daughters had recently moved to Whispering Hills due to Mark's job transfer. April, their 12-year old, was starting to get acclimated to her new school and friends. However, Susie, their 19-year old with Down Syndrome, still seemed to be lost without her normal routine. Although Whispering Hills was about the same size as Pine Bluff, it seemed like the community was lagging behind in providing social opportunities for children and young adults with special needs.

A stirring sound coming from upstairs brought Lisa back from her thoughts. She glanced at her phone and realized that time had gotten away from her. Mark would soon be home for dinner. As she put the scrapbook away on her way to the kitchen, Susie came down the stairs from the bedroom to help set the table. Susie moped around the house most of the day, but seemed to enjoy the responsibility and routine of doing her chores.

Lisa was unusually quiet during dinner. As Mark helped her clear the dining room table after the kids had gone outside, he made it a point to find out what was wrong, "Okay, Lisa. What gives? Why so quiet?"

That was all she needed. Lisa's concerns for Susie's missing social network came pouring out.

They had had this conversation many times before, but it helped to talk about it. "I've been thinking about this," Mark said. "I know how upset this makes you. As big as this town is, there surely must be opportunities available. We just don't know how to find them. There are probably several services and events scattered across agencies and organizations that are not very well coordinated and centralized. Why don't you call your friend who centralized the efforts in Pine Bluff? I think the families here need a champion like Jan to get the ball rolling. You're just the right person to fill the role. Besides, it would be a great way to meet other families in the area."

"I suppose it wouldn't hurt to give Jan a call," Lisa brightened. "Besides, it would be nice to catch up with her. I'll have to summarize a list of what I have found so far before I call."

2. CATCHING UP WITH JAN

Lisa emailed Jan about setting aside some time for an extended conversation to catch up and discuss the coordination efforts Jan had gone through at Pine Bluff. Lisa also sent Jan a list of the opportunities she had found so far, as well as some questions Lisa wanted to ask. (See Appendix A.)

"Lisa!" Jan exclaimed. "It is so nice to get to talk to you again. I've been wondering how your family has been, especially Susie. I know change can be awfully hard. Tell me about life at Whispering Hills while I email my responses to your questions."

Lisa opened the attachment containing Jan's responses as their conversation shifted focus to Jan's work at Pine Bluff. "Now Lisa," Jan opened, "you know that all I did to get things started at Pine Bluff was to ask a lot of questions and create a simple collection point for answers. I really don't provide any services except connecting people with opportunities that fit their needs."

"I'm not looking to provide connections with government services," Lisa agreed. "There are web sites and offices around town that can help me with those resources. What I am interested in providing is a means to connect people with special needs and their care givers with appropriate social opportunities to provide support and engagement in the community. However, unlike you, Jan, I don't know half the

town! I haven't met too many people in our new community."

"How do you think I met half the people in Pine Bluff!" Jan exclaimed. "When I started trying to make connections, I was new to the area just like you. Jason was starting first grade and we were still trying to establish a routine with Michael. Jason is on target to complete his MBA at the local university and, as you know, Michael is thriving in his part time job. I think this is just what you need to get acquainted and, at the same time, make a big difference for a lot of families in your community."

"Lisa, it sounds like you have already started trying to collect some data," Jan noted. "If you have not already, I think you need to start talking to area resource centers, churches and volunteer organizations to see what they are doing and to get some contacts' names. Jason's in a technology-oriented class at school. I'll have him look at my database to see if we can give you a copy to help you organize your resources. My computer is pretty old and the database is as well. I'm not sure if my database will be able to run on a newer computer. Could I call you back about 9:00 a.m. Saturday morning to let you know what I find out from Jason?"

"That would be great! Lisa remarked as she started adding a note to her calendar. "I'll try to talk to some of those organizations you suggested to find out what resources they offer. Talk to you Saturday."

3. WHERE THINGS STAND

Lisa grabbed a pen and her notebook as her phone started to ring Saturday morning. "Jan, thank you so much for calling me back. Those organizations you suggested were a gold mine! I can't wait to tell you what I've learned!"

"I hope you don't mind, but I have Jason with me." Jan started. "I think he will be a great resource for us. Let me put him on speakerphone so he can join in."

"Let me tell you what I have found out from the local social organizations," Lisa began. "In all of the calls I have made, it turns out that one of the area groups had applied for a technology grant several months ago to provide a centralized connection point for providing services to families with special needs. They were awarded the grant and created a dedicated area in their building for providing this resource.

However, the person who had spearheaded the project recently moved away. The money has just been sitting there and they have been looking for the right person to fill the role. They gave me the job on the spot! I was just wanting to help families make connections. I wasn't planning on getting involved in teaching life skills, but what a great gift this could be to the community!"

"Let me jump in for a minute," Jason began. "I'm relieved to hear that you have some money to buy some resources. I don't think my mom's database will work on newer computers. Thus, we are going to have to find something similar for you. How is the technology grant supposed to be used and who is going to provide the training for the technology?"

The technology grant was written to provide a computer, printer and scanner for an office worker to coordinate services and three to five technology devices for a small computer lab, depending upon what is purchased. The building has Internet, but the room would need a wi-fi hotspot. The grant award was for \$3500 and is supposed to cover hardware, software and training as well. Thus, we don't have a lot with which to work. The grant can be renewed each year for up to \$500 to help pay for software, if we choose to use cloud-based programs."

4. GATHERING THE REQUIREMENTS

"The computer lab," Lisa began, "is to be used to provide basic skills training for our special needs clients. This may range from helping people with poor motor skills being able to use a tablet device to communicate, watch videos and search the Internet to basic office skills needed by those clients on the higher end of the spectrum who would need employable skills such as data entry into Excel, Word, specialized programs and online forms.

My computer would need to be capable of doing standard office activities such as email, Internet searches, writing letters and reports and keeping track of budgets on spreadsheets. I could also use this computer for keeping tracking of people and trying to make connections... my original goal. I would like to have some kind of system for keeping track of the families and their needs, job opportunities, social events, angel organizations, volunteers, and any other resource that would be beneficial to track. Since your mom's database doesn't sound like it will work, I would guess that there are systems like

that available. However, they are probably far out of our price range."

"I could research cloud-based systems for you and try to get some prices and feature lists," Jason suggested. "We're supposed to design and develop a database for my class at school. It would be nice to kill two birds with one stone... create a project for class that will, in turn, be beneficial to you. Do you have a plan for how your office is going to run?"

Lisa thought for a moment, "Right now, it seems like everything is pretty informal, but it works. When a family with a special-needs loved one, is looking for opportunities or resources, they often call the local health department. Depending upon who is manning their front desk, the family will be referred to the church or organization with which that person is most familiar. When they get referred to my new office, they record the person's information and look at their list of resources to see if there is a match. If there is, they provide the family with the information and contact name and number. If no resources on the list match the needs of the family, the families' contact information is collected and I'll try to follow up with them in a week or so."

"Okay... What's on the list and how does it get added?" Jason questioned.

"The list contains names and contact information for organizations and individuals who have reached out to the office to offer skills, services or opportunities. The skills, services and opportunities available are also described as well as a date on which the information was recorded, who recorded the information, the cost of the event or service (if any) and the timeframe for which the offer stands."

"I sent your mom an email a week or so ago with my questions for her. She replied with her answers beneath my questions. I think that email may provide you with the information you are wanting," Lisa offered. (Appendix B)

"One last thing... Who is supposed to select, install and train you on the technology?" Jason asked.

"That," Lisa began, "is a good question. I know that the grant is supposed to have some training resources available for training special populations. So, I think that is covered. I am used to working with office technologies, so I should be fine with those."

"I think this would be a great project for my class," Jason noted. "Let me see what cloud-based resources are available that might work for you. I'll also put a technology proposal together of the things I think you are wanting to purchase. I would also like to create a process model of what I think you are envisioning your office operations to be. I'll send those to you in the next couple of weeks and then we can go from there."

5. ASSIGNMENTS

Students should assume the role of Jason or a systems analyst consultant hired to assist Jason.

Request for Proposal (RFP)

Courses: Systems Analysis and Design, Process Modeling, graduate or undergraduate level MIS course

Assume that Lisa is ready to acquire and implement an existing cloud-based system. Her first step is to solicit vendor bids to obtain the technical infrastructure to support the new system.

1. From Lisa'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.

Process Modeling

Courses: Systems Analysis and Design, Process Modeling, graduate or undergraduate level MIS course

Jason would like to draw the functional processes out on paper to verify that he understands how everything will work. He does not want to overlook any important data, details or steps in the process.

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.

Systems Analysis Design and Database Development

Courses: Systems Analysis and Design, Database Development, graduate or undergraduate level MIS course

Assume that Jason is ready 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 student workshop schedule letters, a conference attendance list, workshop attendance sheets, lists of exhibitors, presenters and donations and exhibitor invoices.
7. Create reports including schedules, lists, attendance sheets and invoices.
8. As the database is developed, record any assumptions that you make in a short report.

APPENDICES

Appendix A: Lisa's Initial Email with Jan's Responses

Hi Jan,

Thank you for setting aside some time for us to talk. Let me tell you about my vision.

Purpose: I would like to create a central location where families with loved ones who have special needs can connect to develop friendships, support systems, and opportunities for their loved ones to gain life skills, stimulate their minds and engage in common activities.

Some of the kinds of activities that I had in mind include:

- **Classes** such as cooking, woodwork, painting and gardening.
- **Fun activities** such as outings to the water park, professional sports games, concerts, cookouts or just getting together to watch a movie or play board games.
- **Volunteer opportunities** in which the participants could work as a team on a community volunteer project such as a park clean-up day, a church service event or one of the food packing events for Feed My Starving Children or the local food bank.
- **Jobs** short- or long-term opportunities for participants to be gainfully employed.

Questions for Jan?

1. What kinds of information should be collected about the participants?
2. What kinds of information should be collected about the activities or events?
3. What kinds of information should be collected about the event sponsors?
4. What kinds of information should be collected about the volunteers?

I'm sure there are things I am missing, but maybe that's a start. You can collect additional data.

Take care,
Lisa

Appendix B: Jan's Response to Lisa's Email

Hi Lisa,

You have some great questions! I have provided my answers to your questions below:

Question 1: *What kinds of information should be collected about the participants?*

Answer 1:

- The individual's name, guardian, contact information, age.
- The individual's parent or guardian(s)' contact information.
- The individual's special need(s), capabilities of the individual, the individuals' interests.
- Any health issues that might be important to share, e.g. allergies, sensitivities, seizures.
- Perhaps you would want to collect information about why the person is interested in being connected. What is their goal... socialization, a job, developing a supportive community, etc.?

Question 2: *What kinds of information should be collected about the activities or events?*

Answer 2:

- Some things you might consider include the event or activity basics such as name, date, time, target age, description, restrictions, limitations, concerns.
- Whether or not the event is a one-time event or recurring.
- You might want to include any additional notes about the event.
- The sponsor of the event or activity.
- If the event is a job opportunity, then you would want to collect the job title, job description, skills needed, work days and times, remuneration, duration of employment, name and contact information for the job poster.

Question 3: *What kinds of information should be collected about the event sponsors?*

Answer 3:

- The sponsor's name and contact information.
- Perhaps a brief summary describing who the sponsor is and why they want to be involved.
- Perhaps you may want to include whether or not a background check has been done on the sponsor or should be completed.

Question 4: *What kinds of information should be collected about the volunteers?*

Answer 4:

- The volunteer's name, contact information and perhaps their affiliation with a participant, sponsor or organization.
- The volunteer's interest in becoming involved.
- The volunteer's talent or specialty area.
- Any health issues that might be important to share, e.g. allergies, sensitivities, seizures.
- Perhaps you would want to collect information about why the person is interested in volunteering.

If you have any other questions, please don't hesitate to ask me.

Best,
Jan