

Teaching Case

Cleaning Out the Basement: Designing & Developing a Database to Support an Online Side Hustle Case

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Abstract

With the ease in which individuals can develop an online store and the growing entrepreneurial spirit, many people are turning to virtual marketplaces to earn extra income or, in some instances, build a career. This case focuses upon the development of a database to support an online reselling business that has grown from an occasional hobby to a full-blown business. The case provides a realistic scenario that can be used in a capstone business course, systems analysis and design, database development, or graduate level management information systems course. The case could also be used as an integrative capstone project across multiple disciplines including digital marketing, entrepreneurship, business management, project management, human resources, accounting, finance, information systems, and computer science. Multiple assignment options are provided allowing instructors to select an assignment based upon course material coverage. Suggested assignments include the investigation of developing an online business, 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, multidisciplinary project

1. CASE SUMMARY

In a short amount of time, Tim Carter went from an online resale novice, bent on cleaning out his overstuffed basement, to running a full-fledged online business with plans to hire a part time employee. Tim seeks the help of his next-door neighbor to design and develop a database that will help him keep track of his inventory and sales as well as prepare reports he can use to file his income taxes.

2. THE BASEMENT

"I thought I was going to have free time when I retired," Tim mumbled under his breath as he finished packing a shipping box in preparation for

fulfilling a customer's Facebook Marketplace order.

"You did this to yourself, Timothy Carter," Robin, his wife teased. "Besides, you know you really enjoy the thrill of making a big flip."

Tim couldn't argue with that. It was exhilarating to make a big sale on something he had gotten for free or next to nothing. Tim had recently retired from Whispering Hills Parks District where he had worked as the supervisor of grounds and maintenance for forty years. He was a jack-of-all-trades and could fix about anything. Over the years, their basement had been stuffed with an accumulation of rescued "treasures" park patrons had abandoned during their visits.

Tim had promised Robin, that he would start selling off his “basement bounty” when he retired; and they would use the money to go on a Caribbean cruise. Upon waking the first day of his retirement, Robin held Tim to start fulfilling his promise.

3. ONLINE RESELLING

Tim had friends who had been successful selling items on eBay, Facebook Marketplace, and other social media outlets. He didn’t know anything about how it all worked, but he was a quick study and now had the time to learn.

Tim quizzed his friends to find out how to get started. He also watched numerous YouTube videos to learn how to attractively stage products for photos and craft their descriptions to maximize customer interest. When he thought he knew enough to give it a go, he posted his first item for sale and watched his inbox expectantly for a week before he even got a nibble of interest. Things weren’t happening as quickly as he thought they should; so, Tim decided to do some more research before trying again.

On his second attempt, Tim’s Facebook Marketplace post received a response in a matter of hours. He was already making arrangements to get the product to the customer by the end of the day. The thrill of having his first sale was exhilarating. This motivated him to continue researching ways to tweak and refine his marketing techniques to entice more customers.

In less than six months, Tim found the “secret sauce” that worked for him in selling his products. He had also expanded his online territory into eBay sales. He was making headway on the basement as well as helping his friends clean out some of theirs.

His part time basement cleaning project was turning into a full-time job. Tracking sales, shipping products, and keeping up with the paperwork was starting to get overwhelming. His simple spreadsheet system worked well in the beginning when he was only listing a few products and treated online sales as a hobby. Now, however, he was posting twenty or more products at a time and had far exceeded the IRS’s \$600 threshold for online sales income. (eBay, 2023). He was now classified as a business and, as such, was required to keep track of his revenue and expenses for tax reporting purposes. He was also taking his online sales business more seriously. The spreadsheet

that once collected just a few fields of data for inventory purposes had grown to an unmanageable 35+ fields for tracking and analysis of inventory, sales, customers, and shipment modes.

Tim had made more than enough money to go on that cruise he had promised Robin and she was starting to get impatient for them to start making reservations. Truth be told, Tim was ready to go as well. He needed a vacation from his “retirement vacation” and he couldn’t do that until his paperwork was under control and he hired some part time help to handle sales and shipping while he was away.

4. LOOKING FOR HELP

“Tim,” Robin started as she poured their morning coffee. “You are starting to look frazzled and exhausted. Retirement is supposed to be a time to rest and enjoy life. Why don’t you see if our Janie, from next door, would be interested in helping you with this online business of yours? She had mentioned wanting to find a part time, work-at-home job the other day so she would have time to finish up her online MBA and take care of the new baby.

You know, Robin, that sounds like a great idea. I can at least ask her if she, or someone she knows, would be interested,” Tim said as he picked up his phone to give her a call.

5. THE MEETING

Janie Collins was delighted to get Tim’s call. She was excited about the prospect of having a part-time flexible job she could do from the comfort of her home. She invited Tim over to explain what he was needing during the baby’s morning nap time. Tim printed off his spreadsheet to show Janie. He hoped that, at the very least, she might have an idea of what he could do to better organize his data.

After welcoming Tim into her home and offering him a seat at the kitchen table, Janie watched Tim unroll a series of landscape printed spreadsheet pages that had been taped together end-to-end. “Wow!” she exclaimed as she glanced over the series of columns. “What is that!”

“Well,” Tim started, “it has become a hot mess and part of the reason why I called you this morning. I started selling things online to clean out the basement. However, I have done so well

that it has become a small business and has taken over my life. I need help managing the business as well as managing the data. I had promised Robin that we would do some traveling once I retired, but my "part time" job requires full time work, and I cannot just walk off and leave it. I need help running the business so I can actually enjoy my retirement. I also need help developing a system that will help me manage my data better so that I can keep track of inventory, sales, shipping, and end of year tax reporting.

I brought this spreadsheet over so that you could get a better idea about what I am doing as well as the data that I collect. I am also hoping that you will be able to make something that will help me better manage my data or, at least, give me some suggestions for what I should do or who I could contact who could help me.

What you are seeing here is a portion of the spreadsheet that I use to keep track of my inventory, customers, and sales. I use this data to calculate my income for IRS tax reporting purposes as well as to determine my best products, product categories, customers, and shipping methods. The data was really helpful when I first got started and could read it. However, now that it spans multiple pages, it is hard to decipher. I need some help on two levels, so I have two questions for you: Do you think you can help me run the business? And, do you think you can help me organize my data better, or point me in the right direction to someone who can?"

6. THE ONLINE BUSINESS

"Tim," Janie said as she looked at the worry lines in Tim's face "I know this is troubling you. If you show me the ropes, I think I can give you some of the help that you need. I would like to take some notes about your entire business process. Can you tell me about the business and the data you collect on this spreadsheet?"

Tim could see a little hope on the horizon. "Sure! Let me start from the beginning. I got started in the business by trying to clean out my basement. I had accumulated 'treasures' that were abandoned in the parks when I worked for the park district. Some of them just needed a good cleaning, but others needed some minor repairs. Items listed early in the spreadsheet are some of those items I found abandoned in the park. Since they were free, they do not have a purchase

price, but they may have some costs associated with repair materials."

"So," Janie interrupted, "you track cost and repair data about your inventory. What else do you track about your inventory?"

"Well," Tim began, "now that it has become a business, I have been purchasing a lot of my inventory. I buy things at thrift stores, consignment shops, and yard sales. I like to record the date I purchased the item, the item, the name of the place from which I purchased it (e.g., Jones family yard sale, Salvation Army Thrift store, Goodwill North, Goodwill South, etc.), the address of the place, the price I paid for the item, a general classification of the item, a description of the item so that I can tweak it for my online post, and the repairs required to get it ready for sale. I also take a picture of the item once it is sale ready."

"What kind of data do you collect about the selling of the item?" Janie asked.

Tim continued, "I record the date I placed the item up for sale and the date that the item actually sold. I use those two pieces of data to calculate the number of days that the product was on the market. I record the price at which I initially listed the product and, because some customers make counter offers, the actual price for which the item sold. I also record the taxes paid on the item and the online marketplace I used to make the sale. Once the item is sold, I record customer information such as the customer's name, their address, notes about our transaction, the satisfaction rating I give the customer, and finally, the satisfaction rating that the customer gives me regarding the transaction on the online marketplace."

"Tell me about the data you collect regarding shipping," Janie interjected.

Tim thought for a moment, "I collect the sales price, the calculated shipping charge and the actual shipping charge, the packing materials used and their cost, the shipping label used and its cost, the mode that I used to ship the products (e.g., US postal services, FedEx, or UPS), the shipping company's local address, the day the item was shipped, and the day the item was received. I use those two dates to calculate the number of days it took to ship the product to the customer. I record whether or not the product shipped safely, my satisfaction level with

the shipment, and any notes I may have accumulated about the shipping process.”

“Why are there two shipping charges?” Janie asked.

“The online marketplace calculates an initial shipping charge for the listed item. However, based upon the buyer’s location, the actual shipping charge may be a bit more or a bit less than what the online marketplace charged the customer. I need to keep that in mind when I calculate the full product cost and income-basis for the product. If the actual shipping charge is higher than the original shipping charge listed with the price, then the net income that I receive for that sale is less. If the actual shipping charge is lower than what is posted on the online marketplace price, then I need to claim more income on that sale.”

“Wow!” Janie exclaimed. “There’s a lot more to this than I thought. Can you give me a run down of the rest of the process so I can better understand how your business operates?”

The Sales Process

Tim started, “I have a section of my basement that has a bunch of shelves on which I store my inventory. When I get something that I want to place in my inventory, I record data about the item in the spreadsheet and tape an ID to the bottom of the item so that I can match it to the spreadsheet record. I also take a picture of the item in the staging area of my basement and save the picture on my computer using the assigned ID number.

The basement shelving is sectioned off according to inventory classifications. Items are shelved in numeric ID order so that I can find things... I learned this the hard way. If there is a particular class of inventory that is selling well, then I will go to that section of my basement storehouse and find similar items to list. When I list an item, I copy and tweak the item description from the spreadsheet and find the corresponding staging picture to post. The online marketplace will calculate shipping charges and taxes based upon the shipping choices I select and my location. Those charges are applied to my online post.

When a customer is interested in a product, they will usually ask a question about the product and make a counteroffer on the price. Rarely does a customer initially offer to pay the listed price. If the counteroffer is higher than my costs, depending upon how long the product has been

on the market, I may accept their offer or return a counteroffer. If the product has not been on the market very long or the counteroffer is below the costs that I have in the item, I may reject the customer’s counteroffer.

Once a customer offers the list price or makes an acceptable counteroffer, the sales transaction begins. The online system marks the item as sold, collects payment from the customer, and notifies us both of the sale. At that point, I start preparing the item for shipping. The online system has a wizard that I use to print off the sales label. Once I have prepared the item for shipment, I then take the package to the shipping business, and use the online marketplace to notify the customer that the item has shipped and provide a package tracking number.

After the package is out of my hands, I catch up on updating my spreadsheet. I enter transaction data such as data about the sale, customer, and shipping. Once the customer has received the product, I will record my customer review in the marketplace system and update my spreadsheet with the customer’s review of our transaction.”

“You mentioned something about the IRS and income tax. Tell me a little about that,” Janie prodded.

“Because I make over \$600 in income from my online sales transactions,” Tim began, “I have to report my income. This process is pretty easy since I record the final sales price for each product and all of the costs associated with the sale.”

7. DEVELOPING A SOLUTION

Janie looked at her notes and said, “You’ve given me a lot to think about.” I would like to create a process model of what I think you are doing so that I can make sure I clearly understand how your business works. I just started learning about databases in my MBA MIS course. I think a database would really be beneficial to you in keeping track of your data and minimizing data errors and redundancies. I think if I understand the processes better, it will help me as I try to normalize the fields on your spreadsheet to create the tables in the database. What would you like to do with this data if you had a better handle on it?”

Tim hesitated and then said, “I don’t know what you mean about ‘normalize the fields.’ In addition, the data has gotten so out of hand that

I can't make heads or tails out of it. What I wish I could do with the data is to determine which products are my best sellers; under which classification most of my best-selling products are listed; which product descriptions result in the fastest turnover time; who my best customers are; which form of shipping is the fastest and least prone to damage; and of course, I need to be able to determine total costs of each product sold in order to calculate the net income generated for tax purposes."

"Wonderful!" Janie exclaimed as she continued to take notes. All of that information will help me as I start normalizing the fields to create the diagram that I plan to use to develop the database. I would like to send something to you next week so I can make sure I am on the right track."

"That would be great!" Tim said as the baby started to cry. "It sounds like our meeting is over and that is my cue to leave. I can't wait to get started. I look forward to getting something from you next week."

8. ASSIGNMENTS

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

Integrated Capstone Project

Capstone Course: This project could be assigned in a capstone business program course required of most college of business disciplines. The assignment could draw upon the skills of digital marketing, project management, accounting, finance, entrepreneurship, human resources, and information systems at the undergraduate and/or graduate level.

Students should be assigned to multi-disciplinary teams to address the following issues:

1. Managing the project: Students should breakdown the needs of the project, allocate the work according to skills, and assign tasks and deadlines. (Project Management)
2. Development of a business plan: Students should create a business plan to provide guidance and direction for Tim's burgeoning business. (Entrepreneurship)
3. Development of an employment contract: Students should develop an employment contract to solidify the expectations of the part time job. (Human Resources)

4. Online marketplace recommendation: students should research and recommend the best online marketplace(s) for Tim, or a business like Tim's, to sell his products. (Entrepreneurship / Digital Marketing)
5. Digital marketing plan: Students should develop a digital marketing plan to help Tim increase product sales. (Digital Marketing)
6. Income statements, Balance Sheet, and/or tax reporting documents: Students should create accounting documents to help Tim successfully run his business. (Accounting/Finance)
7. Normalization of the spreadsheet fields: Students should normalize the fields of the spreadsheet to create an Excel Power Pivot or database file. (Information Systems)
8. Development of process diagrams: Students should develop process diagrams to clarify understanding of the business process. (Project Management / Information Systems)
9. Excel Power Pivot or database: Students should create an Excel Power Pivot file or database to manage Tim's data. (Accounting / Finance)
10. For each segment assigned, student should record any assumptions they make, regarding the process, in a separate document. (All)

Internet Sales

Courses: Entrepreneurship, Internet marketing, undergraduate and/or graduate level MIS course

Assume that you are Tim at the beginning of the case. Conduct research to learn about selling products through online marketplaces such as eBay, Etsy, or Facebook Marketplace.

1. Select a product type to sell and a marketplace to research. Record your choices and explain why you made those choices.
2. Research the process of selling products through that marketplace and record what you learned.
3. Research the process of advertising products to sell on that marketplace and record what you learned.
4. Research the way to collect money for items sold through that marketplace and record what you learned.
5. Research the way to ship products associated with that marketplace and record what you learned.

6. Research the way to maintain high reviews on that marketplace and record what you learned.
7. Record anything else that you learned that would be beneficial in starting an online business.
8. Create a list of any online resources you found that would be beneficial to look into in the future.
9. Create a bibliography of the resources that you used for questions 2- 7.

Process Modeling

Courses: Systems analysis and design, process modeling, and undergraduate and/or graduate level MIS course

Janie, the MBA-student, would like to draw the functional process out on paper to verify that she understands how everything will work. She does not want to overlook any important data, details, or steps in the process.

1. Create a diagram modeling the process.
2. Write a short narrative to accompany your diagram to verify and support your interpretation of the process.
3. As the diagram is developed, record any assumptions you make, regarding the process, in a separate document.

Normalization and Database Diagram

Courses: Systems analysis and design, database development, and undergraduate and/or graduate level MIS course

Janie, the MBA-student, would like to normalize the fields and create a diagram design of the database.

1. Work through the normalization process
2. Create a database design diagram using a diagramming tool.
3. Write a short narrative to accompany your diagram to verify and support your interpretation of the diagram.

4. As the diagram is developed, record any assumptions you make in a separate document.

Systems Analysis Design and Database Development

Courses: Systems analysis and design, database development, and undergraduate and/or graduate level MIS course

Assume that Janie is ready to create the database. She wants to:

1. Accumulate the functional and technical requirements for the system.
2. Prioritize the requirements.
3. Create system development diagrams (You may also want to use the diagram created in 7.3).
4. Create a data dictionary.
5. Create data entry forms.
6. Create queries to generate records needed for determining the best-selling products and classifications; turnover rates for products and classifications; most active customers; best shipping modes; and costs and income.
7. Create reports for the queries including product sales ranking list; classification sales ranking list; product and product classification turnover ranking lists; customer ranking list; shipping mode ranking list; and product costs and income generated reports.
8. As the database is developed, record any assumptions that you make in a short report.

9. WORKS CITED

eBay. (2022). 1099-K and Tax Withholding FAQs, eBay. Retrieved on May 25, 2023, from <https://www.ebay.com/sellercenter/resources/2022-changes-to-ebay-and-your-1099-k>