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Beta Auto Dealers: Integrating Disparate Data to Solve Management Problems

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ABSTRACT: In this case, you will examine imprecisely stated management problems and decide what data are needed from disparate legacy systems to solve these problems. The general management issues at Beta Auto Dealers, the car dealership in this case, include sales, marketing, and customer visit information. Since data are stored in multiple information systems built upon outdated flat file architecture, management questions cannot be easily answered.

This case encourages you to demonstrate your skills in both information system design and use. Given data extracted from the "legacy systems" in Microsoft® Excel worksheets, you will create business process maps, use your accounting and business knowledge to determine querying objectives for Beta's management, design a conceptual data model, create a Microsoft® Access database, and import data. Finally, using your database query skills, you will build relevant queries and interpret their results in order to improve management's decision making.

Keywords: database; Microsoft® Access; REA model; E-R diagram; conceptual data model; data queries; process maps; AIS instructional case; legacy systems.

CASE

Beta Auto Dealers, a Honda dealership with two locations in the metropolitan Phoenix area (Mesa and Peoria), sells new and used Honda vehicles and provides service and repair. The company currently employs eight salespeople and carries eight Honda models: Accord, Civic, CR-V, Element, Insight, Odyssey, Pilot, and S-2000. Beta Auto Dealers is one of many vehicle dealerships in the Phoenix area and currently is struggling to stay abreast of the competition. Fred Beta, owner and president of Beta Auto Dealers, is convinced that business can be improved with better marketing and more information and has requested a management meeting.

The following discussion took place in the Peoria location boardroom on a hot July afternoon. Present at the meeting with Fred were Jake Radis and Patrick Murray, dealership managers at the Mesa and Peoria locations, respectively, and Lisa Koepke, the company

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controller. Lisa had asked Hudson Bradfield, a recent college graduate who had double majored in accounting and information systems, to join the meeting. Hudson, in his role as Assistant Controller has been charged with tactical and strategic planning of information systems. Fred opened the meeting:

- Fred: I'm convinced that budgeting more for advertising is critical to our growth. It seems that our competition is more visible in the media. I've decided to increase our advertising budget 10 percent and have been in discussions with our advertising agency, MediaWorks, about how to spend the additional money most effectively. As you know, we currently have seven touchpoints that bring customers into the dealership: newspaper ads, television ads, radio ads, website, word-of-mouth, drove-bys, and Beta owners.¹ MediaWorks is suggesting that we use the additional advertising monies on television advertising. Before I make a decision, however, I'd like to know if this is the area to focus on.
- Jake: I know that television advertising generates a lot of customers for the Mesa location and agree this is where we should spend our money. Here's the June data from our visit information system. As you can see, television advertising generated the most visits to Mesa. [See Table 1.]
- Lisa: I know that you enter the touchpoint only for the customer's *first* visit, so blank touchpoints represent repeat visits. The 56 visits from television ads correspond to only new customers and not to customers who have previously visited the dealership.² We had 57 visits in June that were from customers who had visited before. Since we don't enter a touchpoint for repeat customer visits, we don't know what touchpoint generated these repeat visits.
- Jake: Well, don't ask us to collect that data. If we ask customers every time they come in the dealership what advertising medium brought them in, they would stop coming in! Currently, the system tracks touchpoint as part of the initial visit. A customer should have only one touchpoint.³

TABLE 1
June Visit Information from Mesa Information System

<u>Touchpoint Source</u>	<u>Number of Visits</u>
Drove by	4
Beta owner	11
Website	13
Friend (word of mouth)	26
Radio	50
Newspaper	51
Television	56
Blank (nothing entered)	<u>57</u>
Total	268

¹ Drove-bys are customers who come into the dealership from just driving by and seeing the dealership; Beta owners are customers who have previously purchased or currently own a Beta vehicle.

² The dealership considers all current and prospective customers to be customers.

³ For simplicity, this case assumes that a customer visits the dealership based on one and only one touchpoint.

- Fred: I agree that touchpoints relate to customers. Is there any way to modify the system to associate a touchpoint with a customer rather than with a visit?
- Lisa: Unfortunately not. Mesa and Peoria use the same systems, but the systems aren't networked and some data are coded differently. I think that certain input data are called one thing in Mesa and another thing in Peoria. That was, no doubt, a result of minimal communication between locations when we implemented our systems. At this point, making changes to our systems is cost prohibitive. I don't even know the programming language used or where to obtain the programming expertise. Apparently, the software vendor went out of business several years ago. We really need to do a massive overhaul of systems in the near future, but I guess that is a conversation for another day. [Lisa glances at Hudson].
- Pat: Even if we ignore that problem, I disagree with Jake that we should spend more money on television advertising. I have the June printout from my location's visit information system. At Peoria, we also get a lot of customers based on television ads—in June alone, it was 25 percent of our customers. However, most of these customers are just tire kickers as they always seem to wander around and never buy anything. I think they just don't have anything better to do on the weekend! [See Table 2.]
- Jake: Maybe your salespeople just aren't convincing them to buy! Just kidding.
- Fred: I'm sure that both of you have trained your salespeople well. I don't know the average number of visits before a customer purchases, but sales were up last month. Lisa, how can we find out if we are generating sales from customers who visit the dealership because of television advertising?
- Lisa: Remember that the sales information system is part of our accounting information system, while visits are recorded in a separate, stand-alone system. We input touchpoint data into the visit system but not the sale system. The sales data do not reference a visit number, and the visit data do not include a sales number. Therefore, we are not able to report the touchpoint for a sale. Maybe we could get Hudson to manually match up sales with the corresponding visit information to see what touchpoint generated each sale [Hudson winces here ... not exactly high-level systems work]. Of course that isn't a very efficient way to do that. Also, we still have this problem with missing touchpoints for repeat visits.

TABLE 2
June Visit Information from Peoria Information System

<u>Touchpoint Source</u>	<u>Number of Visits</u>
Beta Owner	8
Drove by	9
Radio	29
Website	29
Friend (word of mouth)	45
Blank (nothing entered)	68
Newspaper	69
Television	86
Total	343

- Pat: If someone is going to manually collect data, then let's add some additional analyses. Right now I get only two reports: Total Sales by Vehicle Model (which includes quantity sold, total sales dollars, and gross margin for each vehicle model) and Total Sales by Salesperson (which includes total sales dollars for each salesperson). While I can print these out at any time, they don't give me enough detailed information on each salesperson's performance. Only knowing the total sales dollars for each salesperson doesn't give me the full picture of how each salesperson is doing. For example, are some of the salespeople more proactive in greeting customers on the lot, or are all salespeople basically greeting the same number of customers? Also, are certain salespeople better at converting their visits to sales?
- Jake: I agree with Pat that it would be helpful to get more information on salespeople's performance. The dealership gets money from Honda for selling Honda warranties and financing. I want to encourage our salespeople to sell these add-ons. I also want to know who sacrifices top price for a sale (thus cutting into our gross margin percentage). Obviously a sale is better than no sale, but selling close to list price is what we want. I want to reward salespeople who generate high gross margins and sell the most add-ons, for these salespeople drive the hard bargain! Right now, we compile this information manually, which is really time consuming. Therefore, we see this information only periodically.
- Lisa: I know, I know. It would be great if the systems talked to each other, and we could generate these types of reports, but again, we are working with an inflexible, mainframe system built in the early 1980s. Right now, Hudson and I are stretched trying to close the books every month. For a dealership this size, a financial close cycle of almost three weeks is too long, but consolidating the data just takes that much time! We've talked about installing an ERP system, but ...
- Fred: Yes, I said it was too expensive right now. Hopefully, Hudson can help us find something down the road. Hudson, haven't you already looked into some type of ERP system for our company?
- Hudson: We've made a lot of progress researching various ERP vendors. However, ERP software for car dealerships is still fairly expensive for a small dealership like ours. Combine the software cost with implementation and conversion costs, and it's even more expensive. I know a lot about databases and Access specifically. Until we convert to an ERP system, we could easily build a database to combine the existing data, and that way we could generate the needed reports without a lot of manual work.
- Lisa: That sounds good. We could use a database to help us analyze data from our existing system. We already have Access. So, we could extract data from our existing customer, visit, and sales programs, and then import this data into a database that we could use to analyze some of the issues that we've discussed.
- Fred: It would be great to get more data analysis, so we can make better decisions. For example, for things like radio and newspaper advertising, we could choose to target these ads toward specific cities or specific vehicle models. If we decide to increase our spending on these touchpoints, where would our money be most effective?

- Jake: I agree with Fred. I could be more effective at managing the Mesa dealership with better information. For example, I know that the Accord is our big seller. However, I don't know what touchpoints are most effective for selling the Accord, or where most of our Accord customers are located.
- Pat: I'd like more information as well. During customer visits we collect information about touchpoint, customer location, age, and gender. We could do so much with this data. For example, we could tailor our advertising and sales if we knew whether gender and age are associated with sales of specific vehicle models or associated with visits by touchpoint. Also, we spend a lot of money on our web presence. Is this investment generating sales for us? Could the database answer these questions?
- Lisa: Yes, it could. Once we have created the database and imported the data, we should be able to generate more useful information.
- Fred: Sounds good to me. Why don't you look at what we've got and see how a database could help us analyze our information? How long would it take to design this?
- Hudson: We could probably have a prototype up and running in a couple of weeks.
- Fred: Okay, let's set up a meeting in two weeks once you've built a sample database and performed some initial analysis.

Beta Auto Dealers Visits and Sales Business Processes

To begin the database design process, Hudson wrote the following narrative describing the visits and sales business processes:

In a car dealership, it is very important for salespeople to make early contact with the customer. Therefore, salespeople are constantly looking for customers either driving or walking around the lot or entering the dealership. The first point of contact occurs when a salesperson greets the customer. The salesperson tries to find out what the customer's needs are, and will show the customer vehicles if the customer desires. During the visit, the salesperson obtains the customer's name and telephone number and asks if the customer has been to the dealership location before. If the customer has not previously visited the location, then the salesperson also obtains the customer's address and asks where the customer heard about Beta (e.g., newspaper, radio, etc.) to help management determine which advertising touchpoint was effective in bringing in that particular customer.

After the customer's visit, the salesperson records information in the visit information system. For a new customer, the salesperson creates a new customer record in the system and inputs the customer's name, complete address, and telephone number. The visit information system assigns a unique identifier as the customer number. For a customer who has previously visited the location, the salesperson uses the name and/or telephone number to look up the customer number. For each visit, the salesperson enters the both date and day of week of the visit, the customer name and number, and the vehicle model(s) the customer viewed during the visit. The salesperson also enters his/her own name and number in the visit system, in case the customer comes back to the dealership (i.e., the salesperson could then continue to assist this customer in hopes of making a sale). Salespeople also use the visit information to make follow-up contacts with a customer. The salesperson inputs the advertising touchpoint for a new customer in the visit system, and leaves the field blank for a customer that visited the dealership before.

A customer may visit the dealership multiple times, and additional visits are recorded as new records in the visit information system. Additionally, a customer may talk with one salesperson on one visit and come in and request the same salesperson or choose to work

with a different salesperson on another visit. Also, a customer may visit different locations, but the dealership has no way of knowing this, as each location tracks its own customers, visits, and sales, separately. Currently, salespeople work at one location, but sometimes may work at another location if that location is short-staffed or running a promotion.

When a customer decides to purchase a vehicle, the salesperson handling the sale fills out a sales form with information about the sale (and this is the salesperson that gets the commission). In the rare event that a customer purchases more than one vehicle at a time, each vehicle is recorded as a separate sale.

If a customer finances a vehicle or purchases an extended warranty through the dealership, the salespeople complete additional forms, from which a bookkeeper enters the information into the system. See Figure 1 for the data fields that were extracted

FIGURE 1
Beta Auto Dealers Data

Data items that were extracted from each location's information systems are listed below. These data items are included in the BetaAutoData.xls file.

Customer Data:

1. Customer number
2. Customer first name
3. Customer last name
4. Customer city
5. Gender
6. Age

Visit Data:

1. Date
2. Day of week
3. Customer number
4. Customer first name
5. Customer last name
6. Touchpoint
7. Salesperson name
8. Salesperson number
9. Model(s) interested in (models they viewed during visit)

Sales Data:

1. Date
2. Day of week
3. Customer number
4. Customer last name
5. Customer first name
6. Model
7. Vehicle identification number (VIN)^a
8. Sales price
9. Cost of Vehicle
10. Warranty (yes/no)
11. Financing (yes/no)
12. Salesperson name

^a Normally the exported data would contain this information. However, for confidentiality reasons relating to identity theft concerns, this information is omitted from the Excel worksheets. When building the database tables, make sure to include a field for this information.

from these information systems. You can also view the Microsoft® Excel workbook containing data extracted from the company's information systems (a link to the Excel files for this case is available in the Teaching Notes).

Requirements

Assume the role of Hudson, Assistant Controller, in analyzing the extracted data to address the information needs revealed in the conversation. Conduct the analysis in the following phases:

- **Phase 1: Construct business process maps for the Visits and Sales processes**
Based on the conversation and narrative, develop business process maps for the visits and sales processes.
- **Phase 2: Develop querying objectives to satisfy Beta's information needs**
Develop querying objectives to address the information needs revealed in the conversation.
- **Phase 3: Draw a conceptual data model**
Draw a conceptual data model of the business entities as represented by the conversation, the business processes, and data attributes using an REA model or an E-R diagram. Indicate minimum and maximum cardinalities. Refer to Beta's business processes and data defined above.
- **Phase 4: Implement the conceptual data model in a database**
In Access, build a database that implements the conceptual model. You should also establish the data properties for each field (e.g., type, size, etc.). You will be importing data from the "legacy systems" via Excel; therefore, you do not need to create input masks or validation rules.
- **Phase 5: Populate the database**
Import data from BetaAutoData.xls into the database. As part of this phase, you may need to clean "dirty data."
- **Phase 6: Create queries and prepare a memo**
 - a. Create queries to satisfy the querying objectives developed in Phase 2.
 - b. Write a memo explaining the purpose of each querying objective, as well as the results of querying and implications for the dealership. Incorporate the results of your queries in the memo.

CASE LEARNING OBJECTIVES AND IMPLEMENTATION GUIDANCE

The ability to use technology tools to solve business problems is an important skill emphasized by the AICPA core competency framework (AICPA 1999). AIS students must develop information use skills, which often require working with “imprecisely stated problems and only general guidelines for obtaining potentially relevant data” (Borthick 1996, 77). Information use skills also include knowing how to extract or create the needed information and display it appropriately. In many organizations, information relevant to addressing business problems is located across multiple, fragmented sources. Unless information is integrated into a single data repository, users have limited ability to address business problems. Consequently, students in an AIS course should develop database skills that will enable them to transform information from disparate systems into more useable forms in their roles as users and designers of information systems.

The purpose of this case is to develop AIS students’ information use skills by asking them to identify information needed to address imprecise business problems. Students also develop information design skills by creating a database that contains the relevant information to solve the business problems. We believe this case provides an important contribution to the AIS case literature by focusing on information use skills in combination with the role of accountants as designers of information systems.⁴

Recent cases have typically focused on accountants’ roles as *either* users (e.g., Borthick and Jones 2007; Borthick et al. 2001) *or* designers of information systems (e.g., Geerts et al. 2002; Geerts and Waddington 2000), but not both. Cases focusing on accountants as *users* of information systems give students fully populated databases and emphasize database query skills. The main goal is to build and reinforce query skills. Our case focuses on both information use skills and design skills. By completing this case successfully, students should develop their skills in:

1. Business process mapping
2. Conceptual data modeling (i.e., REA modeling or E-R diagramming)
3. Implementing a conceptual data model in Microsoft Access
4. Importing data from one application to another (in this case from Excel into Access)
5. Recognizing and cleansing “dirty data” in a database
6. Database querying
7. Written communication

IMPLEMENTATION GUIDANCE

Integration into Accounting Courses

The case is suitable for a first AIS course for undergraduate business students with basic Excel skills. The case can be used (1) for teaching students how to graphically depict business processes, develop querying objectives, model data structures, import data into a database, develop queries, and explain querying results; or (2) for assessing students’ skills in these areas. The “Suggested Extensions” section offers options for adding additional complexity to the case.

Phase Objectives and Additional Information

Phase 1

The primary purpose of Phase 1 is to ensure that students become acquainted with the visits and sales business processes. Using the narrative in the case, students should gain an

⁴ Accountants can have roles as users, managers, designers, and/or evaluators of information systems (IFAC 1995; AICPA 1996).

understanding of the visits and sales business processes by diagramming the activities using process-mapping techniques. Process maps have gained widespread use in industry, and are mainly used to document and redesign business processes. Although process mapping is a popular technique in industry, AIS texts provide scant coverage of the topic (Bradford et al. 2007). Thus, instructors may wish to use the following resources included in the reference section to expose students to the fundamentals of process mapping: Bradford et al. (2001); Damelio (1996); Bradford (2004).

We use Microsoft Visio (cross-functional flowchart template) to draw the process maps included in the Teaching Notes. Many universities and colleges are members of the Microsoft Academic Alliance, which allows students to download Microsoft applications, such as Visio, for free. There are also free trials of flowcharting software available through the Internet. However, students can also draw the process maps freehand without software.

Phase 2

The primary purpose of this phase is to ensure that students understand the key issues facing the company and develop querying objectives that would be helpful in solving management issues. We do not list specific questions in the case for two reasons: First, this decision creates a semi-structured task in which students must determine for themselves both the key business issues and the information/questions that can help management make better decisions. Second, instructors can change the requirements from semester to semester, thereby increasing the case's usability over multiple semesters.

Because our students are beginning AIS students, we often give the following instructions:

1. What is the main business issue identified in the case? Explain why the current information system cannot generate the necessary information.
2. Use the case information to generate one other querying objective relating to touchpoints.
3. Use the case information to generate at least two querying objectives that could help the managers better evaluate the performance of their salespeople.
4. Use the case information to generate one other querying objective not related to touchpoints or the evaluation of salespeople.

Instructors could also ask for a certain number of querying objectives, focus only on one querying objective area (e.g., effectiveness of touchpoints or effectiveness of salespeople), or simply assign students some or all of the querying objectives shown in the teaching notes.

It is important that students understand how general or specific the querying objectives should be. Some instructors may want more specific questions, while others may want overarching questions. Instructors should realize that the specificity of questions in this phase will impact grading in Phase 6. For example, if very general questions are used in this phase (e.g., "evaluate salesperson effectiveness"), there are many different ways for students to answer this question correctly, and the potential variety of student responses will make grading of Phase 6 more difficult. Alternatively, students could be asked to develop more specific queries (or be assigned some specific queries shown in the teaching notes). Specific querying objectives typically have one correct answer, which then makes Phase 6 easier to grade.

Phase 3

The purpose of this phase is to make sure that students understand the entities to be included in the database. Instructors may require students to draw the conceptual model by hand or with a flowcharting package such as Visio.

We give students access to data from the start of the case, as this access more closely mimics a workplace environment where accountants have this information. We feel that this access reinforces the differences between a conceptual model for a database and the flat files in a legacy system. However, instructors may decide not to give students the Excel data file until after this phase. This decision will likely reduce issues with students relying on the current data system to model business practices.

Phase 4

The purpose of this phase is to hone students' database design skills. In designing tables in Access, students should create a primary key for each table, set up appropriate fields (attributes) in the tables, establish relationships between tables, and enforce referential integrity. Students should also be instructed to establish the data type for each field (e.g., number, text, currency).

Phase 5

The primary purpose of this phase is for students to learn how to import data into Access. Additionally, this phase focuses on the real world problems of "dirty data" when converting flat files/legacy system data to relational database format.⁵ When discussing the solution to this phase, we discuss the problems of dirty data and the benefits of implementing an enterprise-wide system (e.g., ERP) built upon a relational database. Also, as part of this phase, students must combine data from several worksheets into one table. This process requires students to build a separate database that allows them to create a query for combining information from two worksheets. Finally, this phase highlights the concept of referential integrity, which mandates that tables with primary keys be imported before tables with corresponding foreign keys. Focusing on importing the data increases students' understanding of relationships, foreign keys, and database structure.

To help students with this phase, we walk students through importing data into the VEHICLE MODEL, LOCATION, SALESPERSON, and TOUCHPOINT tables. These tables have fewer records and it is easier to look over the data that are imported to verify everything imported correctly. We also tell students to reconcile the number of records they import into Access to the number of records in the original Excel worksheets. This reconciliation offers students a good way to double-check their work. In addition, in an introductory AIS course, we provide students with information on how to import data from Excel into Access. This information is provided in Appendix A.

Phase 6

The primary purpose of this phase is to reinforce query, analysis, decision-making, and writing skills. Recent publications have indicated that accountants are spending more time analyzing information, assisting with decision-making, and communicating results (AICPA 1999; IMA 1999). As part of this phase, we often add a requirement for students to discuss other information they would like to see before making a final recommendation to Fred Beta about touchpoint effectiveness. Instructors may want to provide students with the "good form memo" example shown in Appendix B.

⁵ "Dirty data" are data that are incorrect, out-of date, redundant, incomplete, or unformatted. These data must be "scrubbed" or "cleansed" by removing or correcting them.

Individual versus Group Work

We recommend that students complete the case in groups of three or four. We have found that small groups are especially beneficial on Phases 2 and 6 of the case, in which students must create their own queries and write a memo. Groups of three to four allow students to discuss their differing ideas for which queries could provide information that addresses Beta management's concerns. If the case is assigned as a group project, then students can develop their group interaction and communication skills while working on a semi-structured task.

Implementation in Phases versus a Comprehensive Project

Students can complete the case in individual phases, in combinations of phases, or as a comprehensive project. We believe that a phased approach is better for an introductory course, because problems with an earlier phase (e.g., creating a database) will have an adverse effect on students' ability to complete the next phase (e.g., importing data). Therefore, this case has been written in phases. In the phased approach, the instructor should ensure that students are on track by handing out an "official" solution for one phase before students begin the next phase.

We assign this case as a project spanning several weeks. We include a grading rubric in the Teaching Notes that displays the suggested point distribution (see the Teaching Notes, Figure TN1). Instructors wishing to emphasize some aspects of the case more than others can change the grading weights accordingly.

Case Extensions

This case is designed primarily for undergraduate AIS students, but can be extended for more advanced AIS/IS students. Extensions to the case include requiring students to:

1. Convert the process maps into systems flowcharts, so they may obtain further practice with systems diagramming techniques;
2. Convert queries into professionally formatted reports in Access, or export the query data to Excel and produce graphs and charts;
3. Discuss the technical, management, and organizational impacts the database would have on the company. As part of this requirement, students could conduct research on small-to-medium size ERP systems for car dealerships. This research could then be incorporated into the memo.
4. Build an Access form to record the visit information directly into the database. Because the database would be recording source data, students would need to design input application controls such as validation rules and input masks as part of this extension.
5. Model and design a more comprehensive dealership database, including such events as inventory purchases, cash payments, and cash receipts. Obviously this extension is the most difficult, and instructors should determine the exact scope of the project. Instructors choosing to include this requirement would need to add business procedures on the additional aspects of the company, as well as examples of data to be captured.

Case Validation and Reactions to the Case

We have assigned this case in an undergraduate introductory AIS course required of both accounting and nonaccounting majors. After students completed Phase 6, we administered a questionnaire to 43 students asking opinions regarding, for example, whether they felt the project furthered their understanding of databases and required critical-thinking

skills. The students' responses were anonymous, so they felt no pressure to respond favorably to the questionnaire. On a scale of 1 to 7 (with 7 being "completely agree"), the mean (median) responses to the previous questions were 5.7 (6.0) and 6.3 (7.0) indicating that students believed the case helped their understanding of databases and required critical-thinking skills. In addition, 86 percent of the students surveyed felt that the case was relevant to scenarios they may encounter in an actual business setting.

Instructors using the case noticed that students enjoyed working with situational data they could relate to (e.g., car sales, sales of warranties, and financing). Additionally, several students commented to instructors that the case increased their appreciation for databases. While many students did not think that they would be likely to build a complete database from scratch, they saw how database skills could be used to facilitate data analysis.

We have used the case over multiple semesters. Initially, the case was assigned as one phase, and using the case this way proved disastrous for beginning AIS students. Subsequently, we split the case into phases to make it more manageable for beginning students. The case was developed to provide students experience with rich data sets. Students often do not understand the power of databases and queries when they are using databases with only 10 or 20 records and relatively few fields. Using a database with hundreds of data records and numerous fields allows us to demonstrate how powerful and helpful databases can be. Additionally, all of the data records and the richness of data allows for the case to be used over multiple semesters. For instance, we only recently added age and gender information to the case (this allows for a whole new set of queries and data analysis). The Excel data files can be updated and modified by instructors as they desire. This flexibility has helped us to keep the case fresh and minimize student answers leaking out from one semester to the next.

APPENDIX A

IMPORTING DATA FROM EXCEL INTO ACCESS

Create Worksheets of Data for Each Table

1. Print out a copy of the database Relationship Window to use in the steps below.
2. Copy the "BetaAutoData" Excel file and save it with a new name. Make all changes to this new workbook.
3. Within this new workbook, create new worksheets. You will need a new worksheet for each table in Access. Rename the new worksheets to reflect the table names.
 - a. For Excel 2003, insert worksheets by clicking on "Insert" on the menu and then "Worksheet"
 - b. For Excel 2007, insert worksheets by clicking on the "insert worksheet" tab at the bottom of the workbook
4. Copy the applicable data from the original worksheets to the new worksheets (make sure to include labels from the first row). For example, for the "Customer" Worksheet, copy all of the information from the applicable worksheet(s) and paste it into the "Customer" worksheet. When copying data, be careful to ensure you are copying and pasting the correct data and not mistakenly deleting any data.

Work with Data in Excel

5. Make sure that records are *unique*. For example, if you are entering customer information, each customer should have only one record (one row) in Excel. Do not list the same record multiple times. (This will create problems with duplicate primary keys!)

6. Using the Access relationship window as a reference, compare the data in the worksheet to the required fields in the Access table. For example, look at all of the data you just copied to the Customer worksheet. You need to look at the CUSTOMER table in Access and determine what fields you need to keep. Delete any columns in Excel that contain information that is not in the CUSTOMER table. Do this for all of the worksheets and their related tables.
7. Using the Access relationship window as a reference, create new columns in Excel for any fields that are in the Access table but that do not currently exist in the corresponding Excel worksheet. If you are creating a primary key, it needs to be a unique value. If it is not a primary key and you do not have the information, you have two options.
 - a. First, if you do not need the data (e.g., VIN), leave the field blank and it will be blank in Access (remember that non-primary key fields can be left blank).
 - b. Second, if you do need the data but the applicable information is in a different Worksheet, then you need to follow the instructions below for combining data from two worksheets.
8. For each field that is a foreign key, review the data to make sure they exist as primary keys in the corresponding table. If the data do not exist as primary keys, determine what change needs to be made.
9. Make sure that your label headings for each of the worksheets match *exactly* the field names that are shown in the Relationship Window for the corresponding Tables. If your field names do not match exactly, they will not import. (Even an extra space will result in an error message when trying to import data).
10. Save this workbook as BetaAutoImportingData. (Note that Excel 2003 files are saved with an “xls” extension and Excel 2007 files are saved with an “xlsx” extension.)

Import Data into Access

11. Open your Access database. Make sure all tables are closed. Import data from Excel into Access. (This step needs to be done for each table you want to import data into.)
 - For Access 2003, select “File” “Get External Data” and then “Import.” Look in the correct location for the Excel file (making sure to change the file type at the bottom of the screen to Excel.) Now, select the correct worksheet that you want to import first (see comments below). Select “Next” and indicate that the first row contains column headings. Select “Next” and then import into an existing table. Select the table that corresponds to the worksheet into which you are importing data. Select “Next” and then “Finish.”
 - For Access 2007, under the “External Data” tab, in the “Import” group, select “Excel.” Click on “Browse” to locate the excel file you just created. Make sure that “Append a copy of the records to the Table” is selected. Select the table you want to import data into (e.g., “Customer”). Click on “OK.” Next, select the correct worksheet that corresponds to the table you are importing. Select “Next.” Access should recognize that your first row contains column headings. Select “Next” and then import into the existing table by clicking on “Finish.”
12. When you try to import the data, make sure that you import it in the correct order. For example, if a table contains a foreign key, then the table containing that data as the primary key needs to be imported *before* the table where the field is the foreign key can be imported.
13. You will get error messages if your Excel headings do not match the Access field names exactly. Extra spaces and/or different cases will result in import errors.

14. Data can be “dirty.” For example, say the employee table included “department” as a field. One location may refer to the accounting department as “Accounting” while another location may refer to the accounting department as “Acctg” or “01.” Setting up tables for repeating data (such as department) is one way to force everyone to use the same label. However, when you are importing data, you then need to review the data before importing it. For example, if you set up “department” as a table and one of the department records is “Accounting,” you would then need to ensure that data from *all* locations had the department spelled correctly or the data will not import.

Special Circumstances: Combining Data from Two Worksheets

Sometimes the data that needs to be imported into a table is spread across two worksheets. For example, all of the customer data is in one worksheet and the touchpoint data is in another worksheet. You could manually look up and transfer this information, but that is inefficient and time consuming. Instead, you can combine this information in a separate database as follows:

Create Data in Excel Worksheets

- A. In the workbook you have been modifying, insert two blank worksheets for the data you want to combine. Typically, one worksheet will contain the bulk of the information and the other worksheet will contain the extra field that you want to combine. Name the worksheets descriptively (e.g., “Customer_Main Data” and Customer_Touchpoints).
- B. Copy the applicable data from the original worksheets to the new worksheets (make sure to include labels from the first row). For example, for the “Customer_Main Data” worksheet, copy all of the information from the applicable worksheet and paste it into the “Customer_Main Data” worksheet. For the worksheet that contains the extra field you want to combine, make sure that you also add one or more fields to allow the data to be matched between the two worksheets. For example, Customer # should be in both worksheets as this can be used to match up the data in the two worksheets. You may need to include multiple fields if data is required to be matched on several dimensions (e.g., customer #, salesperson #, and date).
- C. Go through steps five through nine from above to make sure the data is all there and is the appropriate data.
- D. Save this workbook as BetaAutoImportingData.

Import Data into Access

- E. Create a blank database and name it “MakeNewTables.”
- F. Import data into a new table. This step needs to be done for each worksheet you want to combine (e.g., for Customer_MainData and Customer_Touchpoints)
 - For Access 2003, select “File” “Get External Data” and then “Import.” Look in the correct location for the Excel file (making sure to change the file type at the bottom of the screen to Excel.) Now, select the correct worksheet that you want to import (e.g., Customer_MainData). Select “Next” and indicate that the first row contains column headings. Select “Next” and then import into a new table. Select “Next.” You do not need to index field names so select “Next.” Choose the Primary Key (e.g., Customer #) and select “Next.” Access will suggest a name for the table. You can accept this and select “Finish.”

- For Access 2007, under the “External Data” tab, in the “Import” group, select “Excel.” Click on “Browse” to locate the excel file you just created. Make sure that “Import the source data into a new table in the current database” is selected. Click on “OK.” Now, select the correct worksheet that you want to import (e.g., Customer_MainData). Select “Next” and indicate that the first row contains column headings. Select “Next,” review the data to ensure you are importing the correct data and select “Next” again. Choose the primary key (e.g., Customer #) and select “Next.” Access will suggest a name for the table. You can accept this and select “Finish.”
- G. Create at least one relationship between the two tables. Create relationships for each field that needs to match up (e.g., Customer #, Salesperson #, Date).

Create a Query to Combine Data

- H. Now that the data have been imported into this separate database and relationships have been established, you can combine the data from the two tables. Your end result should include all of the data that you want in the final table (e.g., all of the data you want in the final “Customer” table).
- For Access 2003, select “Queries” and then “Create Query in Design View.” The “Show Table” dialog box will open. Add the two tables that you want to combine (e.g., Customer_MainData and Customer_Touchpoints) and then close the “Show Table” dialog box.
 - For Access 2007, go to the “Create” tab. In the “Other” group, select “Query Design.” The “Show Table” dialog box will open. Add the two tables that you want to combine (e.g., Customer_MainData and Customer_Touchpoints) and then close the “Show Table” dialog box.
- I. Modify the relationship between the two tables by right-clicking on the relationship line and select “Join Properties.” When you combine two tables, the default is that records that are not in both tables are not combined. However, we want to change this so that we retain the original number of records in our main table—or the table that includes the *most* number of records (e.g., the Customer table and not the Touchpoint table). Therefore, change the property to include *all* records from your primary table (e.g., the Customer table). Select “OK.”
- J. Add fields to the query in the same order as shown in final table from the relationship window you printed in step #1 (e.g., your query should include all fields that you want in the final Customer table—in the same order as shown in the relationship window). View the query. Verify that the query displays the correct number of records.

Copy Query Results from Access to Excel

- K. Copy the results of the query (so that we can then paste these results into Excel).
- For Access 2003, select “Edit” then “Select All Records.” Then select “Edit” then “Copy.”
 - For Access 2007, go to the “Home” tab. Under the “Find” group, choose “Select” and then “Select All.” Under the “Clipboard” group, click on the “Copy” icon.
- L. Open BetaAutoImportingData Excel file. Go to the worksheet for the applicable table (e.g., Customers) and paste the data. You may need to format the data. After pasting, the data should be highlighted.
- For Excel 2003, select “Format” then “Cells” then “Alignment” and uncheck the “Wrap text” box. You can then change the column sizes to auto-fit the data.

- For Excel 2007, make sure you are in the “Home” tab. Under the “Alignment” group, double click the “Wrap text” icon. You can then change the column sizes to auto-fit the data.
- M. Finally, for any fields that are foreign keys and appear to be blank, go into the field and click on the “delete” key (this will ensure that the field is blank rather than having a space in it).

APPENDIX B GOOD FORM MEMO INSTRUCTIONS

Letters and memos are two common formats for business communications. Use letter format when your audience is outside of your organization, and use memo format when your audience is within your organization. *Memos are formatted differently from letters:*

- *Omit the complimentary opening* (Dear Mr. Beta:) *and complimentary close* (Sincerely, Hudson Bradfield) that are included in a letter.
- *Omit the mailing and return address* (because memos are typically internal—sent between employees of the same company—no addresses are needed).
- *If sending a hard copy, initial or sign the memo next to your name on the “From” line.*
- *Label the memo “Memo,” “Memorandum,” etc., at the top of the page, as in the examples below.*

The example below shows a possible way to set up your memo. When you begin to work for a particular company, you will likely have to format your memos in a company-specific way. Many companies have memo templates pre-formatted with the company and/or department logo. However, any memo you write will include the date, recipient’s name, sender’s name, and a subject line. Check templates provided in Microsoft Word for other examples of memo format.

Memorandum

Date: May 7, 2007
 To: Fred Beta
 From: Hudson Bradfield
 Cc: Lisa Koepke
 Subject: Descriptive, Succinct Subject line

The subject line should be very specific to the topic or purpose of the memo. Subject lines are important to memos (as well as emails) because they have a large impact on whether or not the recipient actually reads the message. A vague subject line could cause the recipient to discard the memo (or delete the email) without reading it.

Begin the memo with an executive summary. This paragraph should set the tone for the memo. The summary is also the place to build goodwill with the reader and *forecast* the contents of the rest of the memo by over-viewing the rest of the memo (that is, provide an *abstract* of the memo). When writing a memo to someone who has requested information, refer to that person’s request in the executive summary.

“Talking” headings can be very effective, even in short memos. Headings help the reader quickly skim your memo and know what key topics are addressed. For this memo it would be best to have a heading that corresponds to each querying objective from Phase 2.

In the *body* of the memo, use clear topic sentences and smooth transitions (e.g., In addition ... , Next ... , Second ... , In conclusion ...) to guide the reader through the document. Be simple, direct, objective, and accurate. Avoid puffery, extravagant claims, or egregious overstatement. For example, the database will allow Fred Beta to improve the management of his business; it will not enable him to double profits within six weeks.

As with letter format, *the body of memos should be single-spaced, with blank space between paragraphs and around headings*. As with all business communications, apply visual design principles. Justify the text; straight left and right margins are visually appealing. Be sure to run a spellcheck and a grammar-check on your memos. While these steps will not remove all errors, they will remove many of the more egregious errors that might “grate on the nerves” of your intended audience.

As you discuss each question, reference the queries you have built to draw your conclusions. Use the feature in Access (Tools-Office Links-Publish It with Microsoft Office Word) that exports the output of a query to Microsoft Office Word as a table that can be inserted into the memo. When a table is narrow, place it on the left or right margin and have the text wrap around it. Be very careful when naming and referencing queries in your memo.

Do not end the memo too abruptly. Instead, *include a brief closing paragraph*. This paragraph is the place to bring a *conclusion* to the memo by reinforcing the main points of the memo, ending on a positive note, and letting the reader know what action should be taken in response to the memo.

As with all business communication readability is key! It is a good practice to read your memo aloud to yourself to see that it is easy to follow and understand.

TEACHING NOTES

Teaching Notes are available only to full-member subscribers to *Issues in Accounting Education* through the American Accounting Association’s electronic publications system at <http://www.atypon-link.com/action/showPublisherJournals?code=AAA>. Full-member subscribers should use their personalized usernames and passwords for entry into the system where the Teaching Notes can be reviewed and printed.

If you are a full member of AAA with a subscription to *Issues in Accounting Education* and have any trouble accessing this material, then please contact the AAA headquarters office at office@aaahq.org or (941) 921-7747.

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