Aug 10th, 12:00 AM

Gold Rush Antiques: A Database Management Case

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Completed Research

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Abstract

Gold Rush Antiques is a real-world database management case. Gold Rush is a business with multiple locations across north Georgia which has experienced growth. The scenario engages students in the design and development of a database to advance the organization and analysis of the data about dealers, employees, products, and sales transactions. This case is created at various levels of data management coursework – beginning, intermediate, or advanced. The case scenario is written at a beginner level; teaching notes have intermediate and advanced suggestions (provided upon request). Students are requested to develop a working prototype of a database management system that includes the design of data, tables, forms, queries, and reports. The Gold Rush Antiques case study allows students to not only learn the development of a database but also understand how to examine, analyze, and apply business procedures. To assist the instructor, sample data is provided in the Appendix.

Keywords: Database Case Project, Database Development, Macro, Management Information Systems, MS Access, SQL

CASE OPENER

Gold Rush Antiques (aka Gold Rush) is a small and midsize business (SMB) that focuses on antiques and interior shop design located in Buford, Georgia. Gold Rush is a family-owned business of almost 20 years with multiple locations across the north Georgia region. Gold Rush has undergone incredible growth in the last few years with the opening of three (3) more shops in north Georgia (Dahlonega, Alpharetta, and Marietta).

Within each antique shop exists several booths. These booths house various vendors' goods separated based on vendor, product type, and other characteristics. Gold Rush refers to their vendors as "dealers" and within the shop, several different dealers provide goods and services for the customers who visit. The dealers display their products (i.e., antiques) for sale in individual booths within each Gold Rush shop. Dealers rent booth spaces, varying in size from small to large. Gold Rush earns revenue by taking a percentage of each dealer's sales, this covers Gold Rush's payroll for employees and other overhead expenses.

To address the tremendous growth and increase in presence, Gold Rush management faces two main challenges: they need to (1) have a centralized system to track the employee and dealer information for multiple shop locations and (2) prepare a sales management system (SMS) to manage sales transactions, booths, booth locations, and product inventory. The growth of the business has been faster than Gold Rush management anticipated and the organization's obsolete method of using hand-written price tags, simple cash register transactions, and Excel spreadsheets is not sufficient enough to address their business needs (i.e., maintaining dealer and booth information, product data, employee payroll, and sales transactions).

The owner of Gold Rush recognizes the importance of using technology to maintain information and desires a centralized system across all locations to maintain efficiency and effectiveness. Thus, Gold Rush has chosen to utilize a database management system to maintain data about its employees, dealers, and customers. After interviewing several dealers and employees, the owner of Gold Rush prepared a database requirements report. This report includes business procedures and the data required in the new system.

BUSINESS PROCEDURES & DATABASE REQUIREMENTS

Gold Rush requires a centralized database that tracks dealers, booth information at each location, dealer products at each location, and monitor current product inventory levels (quantity on hand, product costs, & selling prices) and sale transactions (by dealer and employee). Forms should be simple and effective to allow users to enter data about the dealers, booths (location, size, etc.), customer information, and dealer products. Reports explore dealer popularity, product information, and revenue. In addition, specific information about employees from the database for payroll purposes needs to be extracted – this may be outside of the current scope but a definite must for future system development.

Current Procedures

Employee
There are six types of employees at each location: location manager, salesclerk (cashier), sales associate, loader, inventory handler (stocker), and greeter. Gold Rush maintains employee information that includes their name, address, phone, email, employee type, and shop. Employees are hired by Gold Rush to work and manage the shops. Salesclerks or sales associates handle customer purchases. Sales associates work with the customers, support the salesclerk, and work with inventory handlers to replenish and style booths. When customers have finished shopping, they will check out with a salesclerk. The salesclerk enters their employee identification number with the processing of each sales transaction. Loaders are affiliated with the purchased inventory pickup process. When assistance is needed for larger products such as furniture, the added request on the transaction sale is noted in a yes/no format and a loader is assigned to the sale. Other employee types (i.e., managers, inventory handlers, and greeters) are maintained in the database but are not related to the transactions. Gold Rush employs all shop workers; dealers do not hire shop employees and may not have representatives actively selling in booths.

Dealers & Booths
Dealer information is the dealer's name, address, phone number, email, website, and social media tag. Each dealer must go through an application process for a booth in a particular shop. The application process requests an initial deposit of one month. Once the application is accepted, the one-month deposit is held and only returned after the dealer has vacated and left the premises in the same condition received. The dealer takes ownership of the booth upon the approval date. A dealer must sign an initial six-month lease which afterward moves to a month-to-month lease. Rent is due at the beginning of each month and may not be deducted from product sales.

Each shop layout is the same for each location. Each shop location has the same number of booths and booth types. The dealer rents a booth type. This information is assigned and stored with the dealer information. There are three types of booths: 8 x 10, 10 x 12, and 12 x 14. Booth rental prices are based on the shop, location of the booth in the shop, and the size of the booth. There are four shops: Alpharetta, Buford, Dahlonega, and Marietta. A dealer may rent multiple booths; however, they may only have one booth per shop location at any given time. Gold Rush has a goal of having 100% booths rented. This is not always feasible, so at times a booth will not be assigned to a dealer. Gold Rush receives an 8% commission on each sales transaction. There is also a service charge of 4% for all credit card transactions. Each dealer gets a sales payout at the end of each month.

Products
Each dealer may fill their booth with any type of products. However, sixty percent (60%) of products must be considered as antique or vintage and the other forty percent (40%) may be a mix of product types. Each dealer will need to describe their products and explain how they meet these standards in the dealer

application form. Additional characteristics of products are also collected (name, price, color, material, type, where type is furniture, pottery, jewelry, etc.). This is a stand-alone form created once the dealer has been approved. This allows the dealer to fill in this form every time updates are made to their inventory. The dealer is responsible for getting the products to the shop and into the booth, but the Gold Rush inventory handler verifies and stocks the products to give a consistent look across the Gold Rush shops. It is the dealer's responsibility to market their booth and products.

Dealers may sell as many products as they can fit in the given booth space. Although dealers may sell similar product types, their products are assigned individual product numbers. This is how Gold Rush identifies whose products are purchased. This also allows the creation of reports at the end of the month, generated by Gold Rush, to determine the number of sales per dealer and the Gold Rush commission.

Sales

Currently, each dealer must create their own sales label. These labels contain a description of the product and the price that the dealer is selling it for. When working with many different dealers, it becomes difficult to check customers out because the dealers' labels are difficult to decipher. This upsets the customers at the cash register as the transaction takes long because the employees cannot clearly read the labels.

Going forward, Gold Rush would like to implement some standards with respect to its sales process. Creating standard print labels makes it easier to identify the product information and its associated dealer. They do not wish to burden their own staff with attempting to label and manage the information, so a form in which the Dealers can fill out and provide all the pre-identified information is needed. This form and data are collected initially with the application and then each time the dealer wishes to stock more inventory in their booth (weekly or monthly). This will require a system that pre-assigns product numbers and requests any other pre-identified attributes (e.g., standard product type or characteristic list/dropdown). By digitizing and automating these processes, the employees should be able to easily search, scan or enter information upon the sales transaction. After the information is entered, several documents are created: (1) a receipt for the customer, (2) a copy of the receipt for Gold Rush documentation, and (3) a list of products that are picked up at the loading dock for the loaders to prepare.

Forms Requirements

Administrators and employees at Gold Rush would like to have user-friendly forms to ease the process of entering data related to dealers, customers, products, etc. Input forms, data entry forms, and application forms, complex forms including data from multiple tables, are requested to accomplish their goals.

Input/Query Forms

Various stakeholders desire the ability to enter, edit, or query data. Input forms must include labels consisting of descriptive names that represent the business.

Create Input/Query forms for the following tables:
Remember attributes are developed from the functional requirements mentioned throughout this case

- Employee information
- Dealer information
- Booth information
- Shop information
- Product
- Customer
- Sale information
- Any other associated tables

Application Forms

The information arrives from various stakeholders and application forms may be designed to add new information related to the combined data. These forms may include split forms, simple forms, multiple item forms, and/or navigation forms.

1. **Dealer Entry Form:** This should include the dealer's information and the requested application information.

2. **Product Entry Form:** List the project name and characteristics labeled in the functional requirements. Don't forget to assign a unique identifier for each product within each product category.

3. **Transaction Forms:** This is your sales transaction. As the cashier is checking the customer out, they need to collect information related to the sales transaction. Display the employee ID, date, time, sales transaction number, product purchases for that transaction along with the dealer for each product, and any other additional information related to the sales transaction.

Queries Requirements

Queries are used to allow Gold Rush management to address questions and analyze data trends. There are several questions that management would like answered to understand the business needs. It is important for query column labels to be concise and to accurately describe the results.

1. **Dealer List:** List Dealer First and Last Name, Address (all parts), phone, email, webpage, and social media tag.

2. **Dealer-Booth List by Shop:** List each Shop with their corresponding booth types and dealers who currently rent.

3. **Booth Availability:** List all booths by shop that are currently available (not rented). Be certain to include their size and fee.

4. **Product List by Booth:** List booth ID, product id, product name, product type, quantity on hand, and price. Format price as currency. The result should be sorted in ascending order by name.

5. **Customer Product Statistics:** Display customer name, product price, revenue, and total amount of each transaction (including tax). Format the necessary columns as currency.

6. **Dealer Monthly Sales:** Display the month, location, dealer information, total sales, and monthly commission.

7. **Shop Sales:** Display total sales by shop. Show shop, city, and total sales. Sort by shop.

Reports

To further understand their business needs, Gold Rush would like to create management reports. All fields of the report must be labeled with user-friendly descriptions.

1. **Dealer Reports:**
    a. **Product Sales by Category:** This report provides a list of sales transactions based on categories over weeks/months by Dealer. Display the Dealer and their product sales by category. Total columns represented are Total Sales by Product, Total Product Per Category, and Total Sales by Product Category.

    b. **Dealer Monthly (or Annual) Fees** This report highlights for the Dealer the costs/fees they are incurring each month (or year). Representing their monthly payments to Gold Rush and the percentage that Gold Rush charges for the sales conducted. Display the Dealer Name, Address Information, Email, and monthly charges for renting booth(s) and percentage taken from each sales transaction grouped by month. Total columns for month (and/or year).

2. **Booth Rental Status Report:** This report highlights the various booth rentals among the dealers at each store. Gold Rush would like to understand who rents what booths at which stores during which months. Display at minimum the Dealer Name, booths rented, fees collected for each booth, and among which stores. Group by Booth Size and then Store.

3. **Gold Rush Receipt:** This report is a customer receipt. Display transaction and payment information and include the following fields: Date, Transaction ID, Product Name, Quantity, Price, Sales Tax, and Total Amount. The sales tax rate is 7%.

MILESTONES

Milestone One

Milestone One includes the following:

1. Write an executive summary. This should be a 1–2 page project overview. It should briefly describe the initial analysis of the business scenario provided as it pertains to designing a database application. It should communicate clearly what it is you think the system you intend to develop will do in terms of specific functionality that your final product will offer. The executive summary should be as detailed as possible. Some assumptions may be made (in the early phases it is often the case that some things are a little fuzzy), but these must be reasonable and defensible within the context of the Gold Rush scenario. The customer is not a technical person so there should be little to no technical jargon that may confuse them.
2. Create an entity-relationship diagram (ERD). Provide a conceptual data model for your proposed system using a suitable graphical modeling representation. Use any tool you choose to create the ERD. Normalization is a necessary process to ensure that all tables and fields meet integrity requirements, reduce redundancy, and ensure a well-structured database. Final ERD diagrams should be in third-normal form with no transitive or functional dependencies. All attributes of the entities must be shown using appropriate notation. Attributes that serve as identifiers must be underlined. Be sure to list all business rules and other assumptions.
3. Create the database structures. Show all relevant entities and their relationships, including the cardinalities of the relationships and participation requirements set by the Gold Rush Antiques scenario. Appropriate field names, data types, and field sizes should be used for all tables as described in the scenario.
4. Populate all tables with the sample data contained in the Gold Rush Antiques scenario (see Appendix) and any additional data provided by your instructor.

Milestone Two

Milestone Two includes the following:

1. Make corrections based on instructor feedback from Milestone One.
2. Review case study instructions for forms, queries, and reports. Create all needed forms, queries, and reports.
3. Create a simple logo for Gold Rush Antiques and incorporate in your forms and reports.
4. Navigational menu using the Switchboard Manager (advanced option).

Milestone Three

Milestone Three includes the following:

Develop your final prototype and written report.

1. Submit the completed prototype that illustrates your implementation of the work you have completed in prior milestones.
2. Demonstrate your command of tables, forms, queries, and reports, using whatever features are available in your given DBMS tool to make your prototype professional-looking and functional. You can be as creative and ambitious as you wish. However, temper your creativity with the realization that a modest application that works well is better than a flashy one that crashes.
3. Submit documentation representing the creation of your prototype (e.g., database, SQL code, screenshots of forms, queries, reports, navigation menu, etc.).
4. Create a formal, professional group presentation demonstrating your prototype. It should be well organized and rehearsed. You must be prepared to address the overall scope and functionality of your project.

CONCLUSION

Gold Rush requires assistance. As the business has expanded, the demands and workload have increased. Gold Rush's decision to modernize its sales and inventory processes with a database will improve organization and profitability. Management is relying on your expertise to apply data management skills to address their business needs.

This is a term-long database project for students enrolled in an introductory database management course. With the addition of increased complexity, the project may also be prepared for students in intermediate/advanced levels of database management. To complete the project, the student will be exposed to various database development skills. Students will learn to (1) understand the fundamentals of logical and physical data modeling by developing entity-relationship (ER) diagrams, including normalization, (2) create and populate database tables while applying business rules, and (3) create forms, queries, and reports. This project is designed for any relational database management system (DBMS), such as Microsoft Access, Oracle, Microsoft's SQL Server, or MySQL.

Appendix – Sample Materials

Name	Address	City, State, and Zip	Phone
Alenjandro Roller	916 Ridgecrest	Canton, GA 30115	(999) 844-4021
Allan Morgan	1022 Madison Way	Dahlonega, GA 30597	(999) 751-4445
Keisha Moderna	1209 North Avenue	Cartersville, GA 30120	(444) 330-1838
Yong Wei	5810 Jackson Hole	Cartersville, GA 30120	(312) 337-8022
Terry Jones	6721 Bunker Hill Way	Ellijay, GA 30540	(444) 348-1085
Katherine Simmons	46451 Nash Lane	Ellijay, GA 30540	(773) 536-8481
Donny Walker	1190 Meridian	Buford, GA 30519	(312) 337-3822
Ebony Strong	1600 Minnesota Street	Dallas, GA 30157	(272) 285-1386
Fiona Watters	15538 Brook Drive	Dahlonega, GA 30597	(773) 397-1499
Mark Lancaster	135 Concord Cir	Dahlonega, GA 30597	(912) 333-6190
Felix Khan	7132 Fox Run	Marietta, GA 30067	(999) 528-6033
Franklin Pierce	2748 Allegheny	Marietta, GA 30067	(222) 341-8733
Henry Westmoreland	3844 Stone Mountain	Dallas, GA 30157	(272) 331-0574
Joseph Keck	4116 Pinnacle Square	Blue Ridge, GA 30513	(555) 715-1988
Jacob Beath	6502 Oak Ridge Ct	Marietta, GA 30067	(312) 335-6232
Keith Goertzen	1833 Pepperdine	Ellijay, GA 30540	(999) 577-9988
Marcus Darren	19 Johnson Street	Canton, GA 30115	(999) 685-7874
Lionel Mason	2335 Hiatus Road	Marietta, GA 30067	(888) 212-7958
Leigh Ellen March	5606 Pines Blvd	Blairsville, GA 30721	(999) 307-3629
Montgomery Grant	12013 Hollywood Drive	Alpharetta, GA 30009	(312) 281-3418

Table 1. Gold Rush Antiques – Sample Customer Information

Product Categories
Memorabilia
Vintage Vinyl
Coca Cola
Furniture
Military Antiques
Photography & Paintings
Toys
Pottery
Holiday Items
Jewelry

Table 2. Gold Rush Antiques – Sample Product Categories Information

Name	Address	Email	Phone	Employee Type	Shop
Jared Williams	1245 Kentucky Avenue, Buford, GA 30515	jwilliams@email.com	(678) 222-1407	Loader	Buford
Austin Green	4574 Indiana Avenue, Buford, GA 30515	agreen@email.com	(678) 222-9731	Inventory Handler	Buford
John Brown	6085 Illinois Avenue, Flowery Branch, GA 30542	johnbrown@email.com	(706) 222-6188	Greeter	Buford
Sara Beth Grissom	7010 Arkansas Road, Buford, GA 30515	sbgrisson@email.com	(678) 222-5572	Sales Associate	Buford
Victor Walker	135 Missouri Lane, Buford, GA 30518	vwalker@email.com	(706) 222-1314	Manager	Buford
Sandra Spacer	6011 Tennessee Road, Lawrenceville, GA 30042	sspacer@email.com	(678) 222-2637	Salesclerk	Buford

Table 3. Gold Rush Antiques – Sample Employee Information for the Buford shop

Name	Address	Email	Website	Phone	Social Media Tag
Matt Johnson	23 Park Place, Columbus, GA 31909	no3vintage@email.com	no3vintage.com	(678) 257-1313	@no3vintage
Christina Castleberry	68 Oriental Avenue, Montgomery, AL 36106	brookstone@email.com	brookstonememorabilia.com	(706) 257-5679	@brookstonememorabilia
James Brown	92 Charles Place, Birmingham, AL 35242	eaglesnest@email.com	eaglesnestantiques.com	(205) 257-3581	@eaglesnestantiques
Johanna Walker	34 St James Place, Columbus, GA 31909	mypurpose@email.com	mypurposeantiques.com	(706) 257-6190	@mypurposeantiques
Shelley Jones	59 Atlantic Way, Montgomery, AL 36106	greenacres@email.com	greenacresinteriors.com	(334) 257-5574	@greenacresinteriors

Table 4. Gold Rush Antiques – Sample Dealer Information Excel Spreadsheet

Job Titles	Description
Greeter	Welcome customers to store; verify purchases; stand for a minimum of 4 hours
Inventory Handler	Organizes the inventory in the booths, stocks the inventory
Loader	Some retail experience required; Be able to lift and move furniture
Manager	Manages location
Sales Associate	Some retail experience required with preferred merchandising experience; Effective communication skills necessary
Salesclerk	Retail experience required; Computer Skills needed

Table 5. Gold Rush Antiques – Sample Employee Job Titles Information

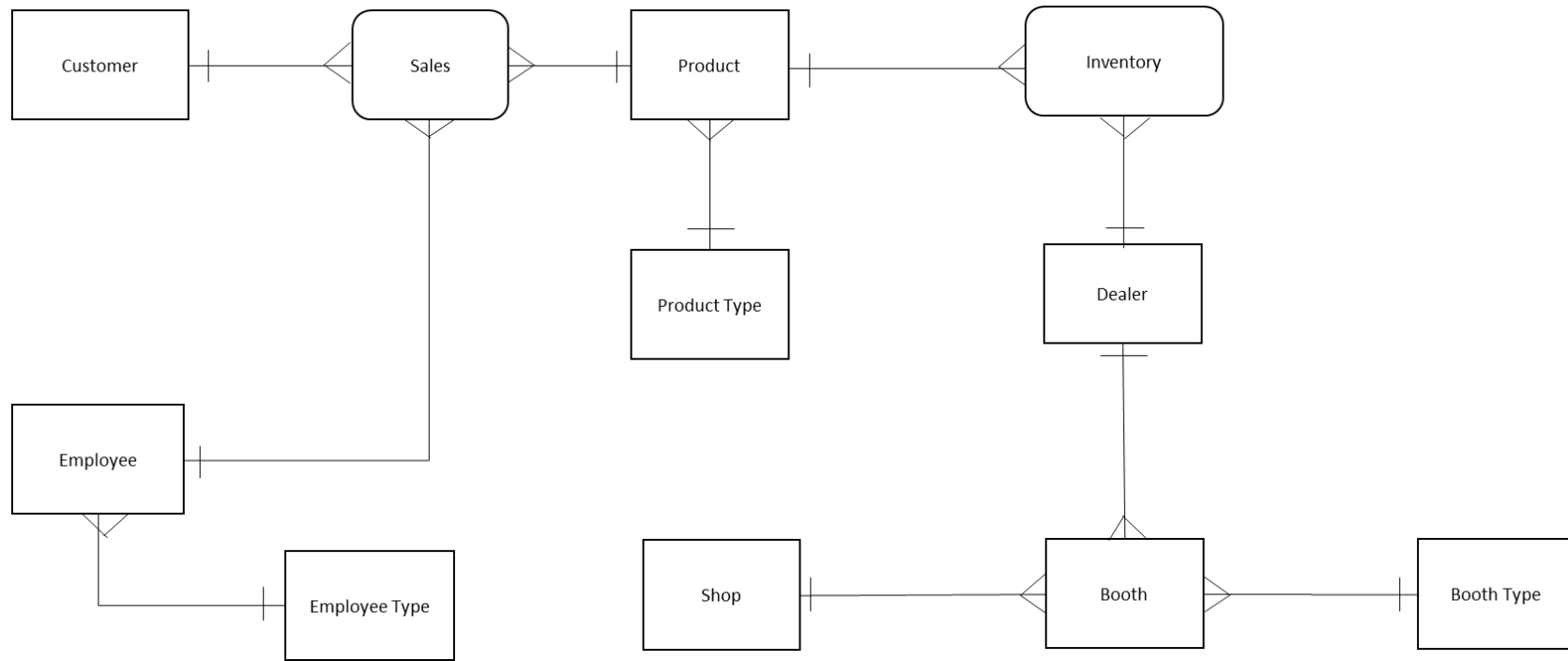| Employee Role	Hourly Pay Rate
Greeter	$10.00
Inventory Handler	$14.00
Loader	$10.00
Manager	$20.00
Sales Associate	$15.00
Salesclerk	$15.00

Table 6. Gold Rush Antiques – Sample Pay Rate Information

Figure 1. Gold Rush Antiques – Sample ERD