Cerulean Bee (2005)

Artwork Order	
Customer Contact Phone Discount Total Price	Order Date Date Approved Scheduled Print Date
Apparel/Item Base Color Maximum Colors	Event Theme
Art Location Description Cost Employee Date Complete	Colors _____ _____
Art Location Description Cost Employee Date Complete	Colors _____ _____

Figure 1

Bob Bee is an artist who has chosen to make his living designing and printing shirts and jerseys for various clubs and events. He named the company after himself and his favorite color. Although he has been in business only a couple of years, it has been successful. Several local clubs sponsor several events each year and want commemorative apparel that they either give to everyone who registers for the event or sell as a separate item. Either way, Bob makes money because he is paid for the work regardless of the number of items that actually sell.

Artwork

Sometimes customers have only a vague idea of the artwork needed. Other times, they come with computer-printed designs. In most cases, an artist still has to clean up the artwork so that it will display reasonably well on the desired item. Ultimately, the art must be color-separated so that each color has its own film. The individual films are assigned to a single print color on the press, and the colors are placed in layers on the final object. Registration, or matching the color separations so the colors do not overlap and the separate layers align perfectly, is a key element in creating a professional product. As shown in Figure 1, an individual item, such as a shirt, could have art in several locations (front, back, sleeve, and so on). Each location requires a separate pass through the print process. Each color requires a separate film and a separate imprint. Although the newer print systems automatically rotate an object through several colors, each print station requires a separate setup, so customers are charged by the number of artwork elements and the number of colors. The total price of the artwork generally includes a setup fee as well as the per item charges. Some organizations are given discounts, but these are somewhat arbitrary and determined by Bob. Most customers create t-shirts associated with some event, such as a festival, race, or bike ride. The artists work the event's theme into the designs.

Employee Work Log

Employee Phone Full Time/Part Time

Date	Start Time	Project	Art Item	Task	Time

Figure 2

As shown in Figure 2, all workers keep a log of the time spent on each project. The most important times are the hours spent on the artwork, but the log does include time spent running the printing press. The log is relatively simple, and employees basically fill out a time card each day. Each major customer order is given a project number, and employees enter this number into their logs. So far, the company does not have a standard method to identify the individual art items for a project, so employees tend to make up descriptions.

Print Order

Customer
Contact
Phone E-Mail

Setup charge
Deposit
Discount
Total Cost

Order Date
Art/Slide Date
Due Date

Apparel Order Date
Art/Film Date
Print Date
Date Delivered

Apparel/Item

Base Color Vendor

Size	Number	Add. Charge
X-Small		
Small		
Medium		
Large		
X-Large		
XX-Large		

Per unit base price Color Charge
Total blank price

Art Print

Location Size # Colors Charge
Color List: _____

_____
Total

Figure 3

Project Cost Analysis

Project Event Item
Customer
Order Date Delivery Date

Material Costs

Item	Per-unit Cost	Price Charged	Units	Cost	Revenue
				Total	Total

Labor Costs

Employee	Task	Time	Wage Rate	Cost
				Total

Total Money Received
Material Charge Artwork Fees Fixed Charges
Total Material Costs
Total Labor Costs
Shipping Costs/Other
Discounts Net Profit

Figure 4

Orders

Once in a while customers just place orders for the artwork, but generally, they really want the art imprinted onto some item—usually a t-shirt. Figure 3 shows the main print order form. This form is also used to guide the overall project timeframe, so several dates are added to it as the order progresses through the system. The first major step is to select the apparel item. The company keeps samples of common items and colors on hand to help the customer visualize the final product. Many other items can colors can be ordered from a selection of vendors. The price of the item is an important consideration in the selection, and vendors have different prices based on fabric and size. Basic sizes are listed at a standard price, but the larger sizes carry an additional charge. The customer has to estimate the number of items desired at each size. Per unit prices also depend on the quantity ordered—with typical breakpoints of 100, 500, and 1000 unit orders. The other interesting twist is that most vendors charge higher prices for darker-colored items. The actual costs and the price Bob charges fluctuate, so they are determined by the clerks at the time of the sale. This form also contains the pricing breakdown for printing the individual artwork. The price is determined by the number of imprints and the number of colors. It is critical for clerks to enter all of the exact colors on the form.

At the end of the month, Bob develops a report that displays a cost analysis for each recent project. He uses the information to help set prices and to identify which jobs are the most profitable. Figure 4 shows the basic arrangement of

the report. Bob usually looks at the net profit data first followed by the subtotal breakdown. He only looks through the detail material and labor costs in cases that seem unusual. Note that all items used in the production of a particular item are listed—including the apparel, film sets, and ink. The labor costs are summarized by task. Even though an employee might have worked on the artwork three different times over four days, there will be one entry for the artwork development. One of the important steps in this case is identifying a standard list of tasks—because employees tend to invent strange names every month, and it is difficult to put the data together to create this report.

Exercises

1. Create the feasibility study (initial proposal).
2. Create a list of all of the forms and reports that the company might use.
3. Create a normalized list of tables for each form and report.
4. Create an integrated list of normalized tables for the entire application. Draw the corresponding class diagram.
5. Create the basic tables in a DBMS along with all necessary relationships and integrity constraints. Enter sample data into the tables to test your design.
6. Evaluate the normalized tables and estimate the size of the database—both current size and estimated size in 3 years.
7. List the initial security conditions for the data tables. Create a list of user groups and identify their basic access needs.
8. Design the overall structure of the application. Outline the overall structure and the primary forms. Select a design scheme, including layouts, effects, and colors.
9. Build three initial input forms.
10. Build three initial reports.
11. Improve the forms and reports to make them easier to use.
12. Test your forms and reports with sample users.
13. Build additional forms and reports. Improve all of them. Test all of them.
14. Connect all of the forms and reports into an application. Add help files. Test all the links. Test the forms and reports. Check for consistency.
15. Add security, backup and recovery, and other management features to the application.
16. Move the data tables to a centralized server, leaving the application to run on a client. Build the necessary links and retest the application.
17. Move the entire application to a Web server. Build the forms so that they run on a Web browser.
18. Create an OLAP evaluation query and graphs. Build in a way to create the links so new annual data can be generated automatically. Link the data so that the spreadsheet is updated automatically.