

Introduction

In 2007, John and Joan Smith opened the Blooming Fitness Center (BFC) in Ames, Iowa. This business was the culmination of the dream of the Smiths to open their own health and fitness business, after having worked in this industry for others for several years. As husband and wife, John and Joan have thoroughly enjoyed the opportunity to work together over the last ten years in building a successful family business.

Compared with other businesses in the personal fitness industry, BFC is somewhat different: it is not simply a gymnasium facility stocked with exercise equipment for use by paying customers. Instead, the Smiths' business plan was to create a learning center that emphasized offering classes on fitness techniques and skills that could be learned by patrons from trained instructors. The fees paid by members of the center for these classes make up the largest of the three sources of revenue for the business. Another revenue source is the initial membership fee paid by center members upon joining BFC. The other revenue source is the sale of fitness supplies in the store located in the center. This store carries both fitness clothing (e.g., work-out suits, sweat bands) and also nutritional supplements (e.g., vitamins, protein powder). See Exhibit 1 below for some examples of products sold at the store.



Exhibit 1: Examples of products sold at BFC

As the business has grown and developed, John and Joan have found that the volume of paperwork associated with running the business has also substantially increased, and has become very difficult to properly maintain. They are concerned that their business will not be able to successfully continue growing without a more timely and accurate means of maintaining the records of the business. This realization has led them to decide that the adoption of a computer-based record keeping system is their best interests. They have invited several system development consulting firms, including yours, to visit them to discuss their business needs and to propose an automated solution. They will review the proposed solutions from competing consulting firms and will ultimately select one firm to develop and implement their final system.

A systems analyst with your consulting firm has already conducted an initial interview with the Smiths and has provided the information contained below on BFC. You and the other members of your consulting group will take this information and go forward with your plan for presenting the Smiths with a system solution that you hope will win their approval.

Personnel

BFC employs a number of different types of employees: *fitness course instructors*, *clerks* in the fitness store and *administrative personnel*. A record of past and present employees of the company includes employee name, address, phone number(s), hire date, position and status (current or former). Employees also have a unique sequential four-digit employee ID number assigned to them when they are originally hired. For clerks, BFC would also like to record negotiated hourly rate.

Payroll is presently outsourced to an accounting firm. This is expected to continue and will not be a part of the system to be developed.

Members

Of course, information is also recorded for members of BFC. When joining the center, individuals have a unique sequential six-digit member ID assigned to them. Also recorded for each member is his or her name, address, phone number (home and cell), gender, age, date of birth and date of joining BFC.

Each member chooses one of the four available membership types: Platinum, Gold, Silver and Bronze. Each of these membership types has a fixed joining fee associated with it. At this point, these fees in descending order from Platinum to Bronze membership types are \$500, \$300, \$100 and \$50; note that these fees could change over time. This is a one-time fee that establishes a lifetime membership in the center. The reason for the varying joining fees is that each membership type also has an associated discount percentage associated with it. This is the percentage amount that the member will have deducted from all their future purchases at the center, applied to both course enrollments and item purchases at the center store. The specific discount percentages, in descending order from Platinum to Bronze membership types are 30%, 20%, 10% and 0%. Thus, the joining member chooses a membership type (and its related fee) based in their expectation of the value of the discounts to be received from their purchases in the future. As an incentive to get new members to initially purchase the highest priced memberships possible, BFC does not allow upgrades to the membership type. A member wishing to purchase a higher membership type must rejoin, be assigned a new membership number, and pay the full joining fee.

Fitness Courses

BFC offers over thirty different personal fitness courses. Courses include such exercise-based subjects as yoga, tai-chi, weight training and aerobics and also other fitness-oriented topics such as nutrition and natural medicine.

Each fitness course instructor needs to be qualified to teach a course. Both John and Joan Smiths are experts in all subject matter taught at BFC and judge when an instructor is qualified to teach a course. The date a fitness course instructor qualifies for teaching a particular course needs to be recorded. A fitness course instructor can be qualified to teach many different courses or may not be qualified to teach any course.

Each course has a unique course number assigned to it when it is created. Additional important information related to each course is the course name, description, category (3 categories – novice, intermediate and advanced), usual duration (number of weeks that a course is designed to be run) and fee (price of the course prior to discounts). Note that there are no prerequisites, as such, for taking a class of a course.

Courses are offered periodically in the form of classes – a class is a specific offering of a course. Each class has an associated reference number, which is not necessarily unique; a combination of course number and class reference number is unique. Also recorded on the teaching schedule for each class is the start date for the class, the days of the week the class will be held (e.g., M, M/W/F, Th/F), the time period that the class will be held and the instructor who will teach the class. Usually the Smiths try to ensure that instructors who are qualified to teach a course are the ones who teach a class – but then it is not always possible to find a qualified instructor for each class. Each class is taught by exactly one fitness course instructor. Each fitness course instructor must teach at least one class and could teach many classes. Each class is allocated exactly one room.

Facilities and Equipment

Each room in the center has a unique sequential room number and a class capacity associated with it. The latter is the maximum number of members that can participate in a class being held in that room. This number is important in preventing classes from being overenrolled.

Some of the rooms in the center contain pieces of exercise equipment, which are not moved across the rooms. Each such piece of equipment has a unique serial number (provided by the manufacturer) that is used to track it in the center. Also recorded for each piece are its purchase date and the date of its last maintenance. Each piece of equipment belongs to a specific equipment type; for example, the equipment type of “Healthrider R60” is treadmill.



Healthrider R60



Equipment ID and inspection/ maintenance tag

Exhibit 2: Example of equipment at BFC

Merchandise Sales

As mentioned earlier, BFC also maintains an in-center store for the sale of merchandise to members. The items for sale in the store are identified by a unique item number. Also recorded for each item is its description, standard price (price before discount), the quantity on hand and the reorder point. Reorder point is the minimum quantity of an item that should be kept on hand. If an item’s inventory level falls below this point, the item is noted for reorder from the vendor that supplies it. Exhibit 3 shows Q (quantity in hand) on the Y -axis and time on the X -axis; also note that R is the reorder point and that L is the lead time.

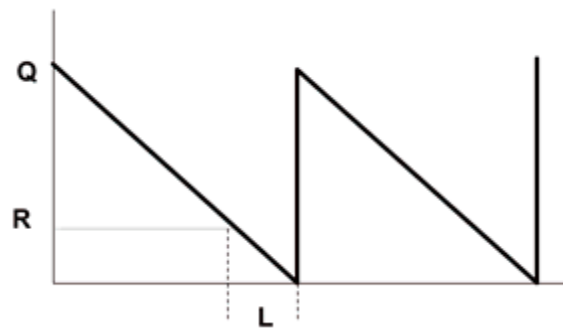


Exhibit 3: Reorder point

Whenever a BFC member comes into the store and purchases one or more items, a unique seven-digit order number is generated; note that only BFC members can make a purchase. The member making the purchase and the date of transaction are also recorded. Of course, the specific items purchased, along with the quantity of each item and the selling price per unit of each item is also recorded; the Smiths may give special director's discounts on items purchased. The overall purchase total is also calculated for each order.

Conclusion

The Smiths need to keep track of various activities in the store and would like you to ensure that the following reports can be generated. They want to know the total number of members enrolled in each course/class (Exhibit 4-1), the most popular course (i.e., a course with the most number of offered classes and most number of enrolled members), total number of members enrolled in each membership type (Exhibit 4-2), and the different courses that each facility course instructor is qualified to teach (Exhibit 4-3). Many times, a scheduled employee may not turn up for work. In order to schedule a backup, the Smiths would like to find all the employees (employee name) who live in a locality with a certain zip code, usually the same as that of the BFC (Exhibit 4-4).

| Course Name | Class Name | Total Members Enrolled |
|-------------|------------|------------------------|
| Yoga | Morning | 10 |
| Yoga | Evening | 25 |
| ... | ... | ... |

- 1) Report layout to display the total number of members for each course and class

| Membership Type | Total Members Enrolled |
|-----------------|------------------------|
| Platinum | 100 |
| Gold | 250 |
| ... | ... |

- 2) Report layout to display total number of members for each membership type

| Course | Qualified Course Instructor |
|-----------------|-----------------------------|
| Yoga | M. Stewart |
| Weight training | A. Schwarzenegger |
| Weight training | M. Stewart |
| ... | ... |

- 3) Report layout to display various courses and qualified course instructor/s for each course

| List of employees who live in the zip code | 47401 ▼ |
|--|---------|
| M. Stewart | |
| A. Schwarzenegger | |

- 4) Report layout to search employees who live in the zip code '47401'

Exhibit 4: Examples of sample reports that need to be generated

The Smiths are optimistic that a well-designed database system will substantially support their overall business objectives. They are depending on you to analyze their business to identify areas that can benefit from such as system and to design and develop the system itself. They have promised to work closely with you and to provide full support in the development process. You and your team are excited at the prospect of undertaking this challenge.