Sequoia Grove

Employee Database

CS 342, Fall 2015

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Phase I

Part 1: Fact-Finding Techniques and Information Gathering

1.1.1 Introduction to Enterprise

The Sequoia Sandwich Company is a local delicatessen that serves sandwiches, salads, soups, and bakery desserts. They also offer catering for groups in the form of sandwich platters, boxed lunches, along with options to add beverages, chips and side salads. There are currently four locations, three in Bakersfield: downtown, southwest, and Rosedale, plus one in the Fresno/Clovis area.

1.1.2 Fact-Finding Techniques

Operating procedures pertaining to the company were discovered primarily through prior experience working for the company in addition to research from their website. Operations on the data will be handled by the person in charge of scheduling which is the branch manager at the location. The database will be used to generate reports describing employees and their current work availability.

1.1.3 Focus of Database

The focus of the database is management of employee work availability and weekly scheduling. The company currently stores its employees' availability on pen and paper. The manager then references this paper to type the weekly schedule in a Microsoft Excel spreadsheet, which uses formulas for counting the current number of days that any given employee has on the schedule being created. This formula is not very comprehensive, as it will not even compensate for misspellings. The manager must manually cross check several scheduling criteria on their own. The employee must availability for the shifts and days that they are scheduled for, they must only be scheduled once per day, they cannot work days requested off, they may not work well with another employee, and can only work shifts corresponding to roles they know. The schedule created is printed out upon completion, and posted at the work location. This means employees must copy this information down for their own reference, and if the schedule is changed, employees are not aware of the changes and may either show up to a shift they were not scheduled for or not show up for a shift that they need to work.

Managing everyone's shifts is a laborious and error prone task to do by hand. Our database seeks to solve this problem by providing automation of these checks in an employee management system that will track employees and their work availability given the above constraints, so that managers can quickly and accurately schedule employees for the weekly schedule. Employees will also be able to sign into the front end with a different set of permissions, allowing them to view the weekly schedule without have the ability to modify it. This will provide them access to the latest copy of the schedule anywhere they can access the internet.

The main entities needed to represent this employee scheduling database are Employees, Roles (or Employee Positions), and weekly Shifts. Although other entities will be included to represent the remainder of the shop, these are the entities needed to the database's primary purpose. This front end will focus on coordinating employee scheduling with shift openings, in addition to displaying Supply Deliveries to help employees prepare for the day.

Employee entities store basic employee information such as first name, last name, birthday, and phone number. They also store information pertinent to scheduling: dates when employees were employed and unemployed, and the maximum number of hours employees desire per week.

Role entities simply store the different positions an employee can work; the only attribute they store are the names of different positions within the company. Most of the relevant information regarding roles is in their relationship with Employee entities.

Finally, shift entities store information pertaining to a particular time slot for an entire week.

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1.1.4 Itemized descriptions of Entity Sets and Relationship Sets:

including their names, meaning, attribute names and detail properties of each attributes, cardinalities and participation constraints of relationship.

* employee (id, is\_manager, first\_name, last\_name, date\_employed, date\_unemployed, birth\_date, max\_hours\_per\_week, phone\_number)
* role (id, title)
* shift (id, title, weekday\_start, weekday\_end, weekend\_start, weekend\_end)
* delivery (id, title, weekdays)
* ingredients (id, name, available, date\_expired)
* menu\_item (id, name, type, price, photo)
* transaction (id, date)
* requests\_off (requested\_by, approved\_by, start\_date, end\_date)
* has\_role (employee\_id, role\_id, is\_training, date\_acquired, date\_removed, is\_primary, max\_days\_per\_week)
* has\_shifts (role\_id integer, shift\_id integer)
* is\_scheduled\_for (employee\_id, shift\_id, date\_scheduled)
* has\_availability\_for (employee\_id integer, shift\_id)
* cannot\_work\_with (employee1\_id, employee2\_id)
* delivers (ingredient\_id, delivery\_id)
* used\_in (ingredient\_id, menu\_item\_id, quantity)
* sold\_in (menu\_item\_id, transaction\_id, quantity)

1.1.5 User Groups, Data Views, and Operations:

The User Groups are primarily defined by the is\_manager attribute within the Employee entity. This attribute dictates access to views that allow the user to add information to the database, as opposed to only visualize it. More specifically, User Groups are defined by Employee Roles; in descending order the privilege levels are: managers (branch manager and store owner), shift supervisors, and then all other employees (cashiers, janitors, food prep, etc).

managers-

reading, creating, updating and deleting schedules (past schedules may not be deleted)

reading, creating, updating and deleting employees

reading(view requests off), creating(submit requests off), and updating (approve/deny) requests off

reading, creating, updating, and deleting scheduled weekly deliveries

all employees-

reading schedules

reading (view own requests off only), creating(submit requests off), and updating (cancel own requests off)

reading weekly deliveries (shown on schedule)

For step 2, document the conceptual database design

Conceptual Database Design

2.1 Entity Set Description

Entity UVW:

name (use intuitive name)

description: what is the purpose of the entity type, what information are held in the entities of the relationship type, and other information about the entities in the set (such the frequencies of insertion, deletions, and updates).

Attribute descriptions

name

description

domain/type

value-range

default value

null value allowed or not?

Unique?

single or multiple-value

Simple of Composite

candidate keys:

primary key:

Strong/Weak Entity

Fields to be indexed

Entity XYZ: …

2.2 Relationship Set Description

Relationship ...:

Name (use intuitive name)

description: What is the relationship type for, the purpose of relations, what are the entities involved, meaning of each descriptive data field. Multiplicities and mapping cardinality.

Entity set involved

Mapping cardinality

Descriptive field

Participation Constraint: Partial/optional or total/mandatory

2.3 Related Entity Set

Describe the following and point out entity types and relationships that are derived with the specialization/generalization process.

Specialization/Generalization Relationships(is-A) Participation constraint Disjoint constraint

Aggregation/has-relationship Composite

2.4 E-R Diagram

Label the entity types with attributes, relationship types, multiplicities.