**Requirements**

Eggshell is a local home builder company which builds typical midsize subdivision houses. Currently, there is only one sales representative who is responsible for all the paperworks and customers’ requests. The manual paperwork and inefficiency in handling customers’ requests such as floor plan inquiry and photo inquiry make Eggshell Builder start to develop a computer system with a relational database which can be used to handle data storage and data access for both employees and customers.

Before the development of the system, Eggshell Builder specifies the requirements it needs to support the operation. Normally, it takes 4 to 6 months to build a house. The building process is divided into different stages. Houses can be sold before they are built. Houses are built on subdivisions. And, there are 3 or 4 styles of houses in each subdivision, each with a different name. Each style has a slightly different exterior which is called elevation. Elevation A is the basic design. Elevation B and C have slightly different rooflines, or stone accents.

Currently, Eggshell has about 80 open contracts, managed by one sales representative. To reduce the workload of the sales representative, the owner wants to put more information on the website to make it easier for buyers to choose houses and options. The basic information of house styles includes subdivision number, style name, base price, style description, size, photo, and size. Further, the information of house styles also contains specific information of different rooms, including room name, size, floor, comments, number of windows, ceiling, elevation, description, and additional cost sketch. Ceiling information describes the tall cathedral ceilings typically used in the entranceway and living rooms. In addition to the photo, the builder would like to include links to the floor plans in the future. And, one additional element of whether the house is built as shown in the photo or reversed is needed.

Besides the information of houses, some information about subdivisions and lots is needed as well to support both employees and buyers. A map of subdivisions is included to inform both buyers and employees about which lots have been sold. Each lot is already assigned with a specific house style. Each lot is numbered and has been given an address by the US post office. Latitude and longitude are stored for each house for future reference. Further, for each subdivision, buyers usually want to know about the closest school districts.

Buyers also need to decide on the options. The sales agent and the design department write down changes. Buyers often revise their choices. To cover the costs, Eggshell Builder always charges additional costs for making changes after certain stages. There are 7 stages in the construction of a house. The buyers can only see 3 of them. Stage 1 is when the foundation has been poured. Stage 4 is when the framing is complete. Stage 7 is when the interior walls are finished. Some options can only be purchased before certain stages. For example, plumbing choices must be made before stage 1. Some prices of options depend on stage, such as electrical wiring for light. Prices of options need to support editing, as they can vary over time, especially as labor costs increase. Options are listed by category. Buyers will want to sort this list by category, or other columns. Some options such as electrical lights and phone jacks require a detailed description (and usually a diagram) to indicate their exact position. Interior design options such as carpets and tile require the specific style number and manufacturer for each selection.

Buyers’ choices of options are recorded on a form (Decorator Choices). Separate design sheets are submitted at different stages. The sales or design representative is responsible for choosing the correct price at different stages.

The construction manager tracks the progress of each house and evaluates the work crews in terms of that progress. Construction manager needs to keep the data up-to-date and make it available to sales representatives. Eventually, the same data is provided directly to buyers. In construction progress form, major tasks remaining for the current stage and estimated completion date including a statement that the estimate is subject to change at any time are listed. Also, basic information such as city, subdivision, lot id, date, stage, percent completed, task descriptions are provided as well.

To make the sale, an initial contract is signed. The buyer writes a check for the escrow amount which is usually $1,000 to $2,000. Basic information of the buyer including name and address is included. The signed date and sales representative information are also needed. Basic details of the lot and the house are recorded. Contract is often signed before construction has begun, the legal agreement has a time limit of a year, after which the customer can cancel the contract if the house is not finished. Buyers have to obtain a loan and the bank’s information is also recorded. At the end of the contract, the buyer has to initial each item in the list to indicate that he or she received all the required forms and manuals. And, contracts do not change very often.

After the requirements are clarified and specified, additional business rules and assumptions will be made by the database design team to enforce the integrity and to ensure that the database can be used to support efficient operations of Eggshell Builder.

**Requirements By Bullet Points:**

**Houses**

* Can be sold before they are built
* One subdivision can have 3 houses, each with a different name
* Elevation: Each style has a slightly different exterior; A is a basic design, elevation B and C have slightly different roofline, or stone accents
* Eggshell has about 80 open contracts.
* Description of each room will help buyers visualize the house.
* Ceiling information describes the tall cathedral ceilings typically used in the entranceway and living rooms
* In basic information of styles, in addition to the photo, the builder would like to include links to the floor plans.
* Additional element:
  + Can be built as shown in the photo or reversed

**Subdivision**

* A map of subdivisions is given to support both customers and employees since it shows which lots have been sold.
* Key Feature of Subdivision:
  + A specific house style has already been assigned to each lot
* Include school district information

**Lot**

* Each lot is numbered and has been given an address by the US post office.
* (Assumption: lat & lon stored in lot) Latitude and Longitude are stored for each house for future reference.

**Options**

* One of the most challenging is to decide on options.
* Hold down cost, Eggshell offers a limited number of options.
* Sales agent & the design department write down all changes, and the builder wants buyers to choose options quickly.
* Buyers have trouble making decisions and may want to revise.
* The builder charges additional costs for making changes after certain stages.
* Plumbing choice must be made before stage 1
* Some prices of options depend on stage, such as electrical wiring for light (need to rework the wall)
* Price of options can vary over time, especially as labor costs increase.
* Options are listed by category.
* Buyers will want to sort this list by category, or other columns.
* Electrical lights and phone jacks require a detailed description (and usually a diagram) to indicate their exact position.
* Interior design options such as carpets and tile require the specific style number and manufacturer for each selection

**Stage**

* 7 stages for builders
* 3 can be seen by buyers:
  + Stage 1: when the foundation has been poured
  + Stage 4: when the framing is complete
  + Stage 7: when the interior walls are finished

**DecoratorChoices**

* Buyers’s selection are recorded on a form (Decorator Choices)
* Separate design sheets are submitted at different stages.
* The sales or design representative is responsible for choosing the correct price.

**Construction Progress**

* Construction manager tracks the progress of each house and evaluates the work crews in terms of that progress
* Detailed information is not needed by the buyers, but they want to keep an eye on it
* Currently:
  + Main sales representative walks the subdivision so she can respond to phone
  + But she can’t remember the details
* But design decisions have to be made by cefrtain stages, provide listing of the progress of each house
* Construction manager - keep the data up-to-date and make it available to sales representatives.
* Eventually, the same data is provided directly to buyers.
* List:
  + Major tasks remaining for the current stage
  + Estimated completion date (include a statement that the estimate is subject to change at any time)
  + (photo not included)

**SALE**

* Initial Contract:
  + The buyer writes a check for the escrow amount ($1,000 to $2,000)
  + Basic details of lot and the house are recorded
  + Contract often signed before constructions has begun, the legal agreement has a time limit of a year (After which customer can cancel the contract if the house if the house is not finished)
  + Buyers have to obtain a loan
  + No need for paperworks after the house is finished, as they are required to be entered manually
  + Contract does not change very often
  + Buyer need to initial at the bottom of the contract to confirm their awareness of the manuals and forms