



# EggShell Home Builders

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# Case Description

- Background:
  - Eggshell is a **local home construction firm specializing in midsize subdivision houses**. The company starts 10 to 20 houses at a time and now has about 80 open contracts, while the house construction usually takes 4 to 6 months.
  - **The company faces challenges in managing paperwork and seeks to migrate its database online.**
  - This presentation outlines the **business rules governing the database.**

# Key Business Rules

## 1. Construction progress

- a. Construction manager must update the construction progress for each lot, and include the latest stage and estimated completion time; Construction manager must be able to update buyers on the construction status.
- b. When there are construction updates, the construction manager can choose to update the individual task items or update the construction progress directly.

## 2. Decorator Choices

- a. When buyers want to modify their decorator choices at different stages of the construction process, sales representatives help them to update the decorator items and thus update the decorator choice table(date of such modification). There might be a change in cost in labor and material associated with such modifications.
- b. When customers choose the decorator items, they need to choose from the option tables.

## 3. Sale

- a. While the base price is firm based on different lots, the lot premium is flexible based on different choices made by the customers and they can negotiate the price with sales representatives
- b. Sales representatives and customers should be aware that Eggshell's prices increase by 2 percent every year to account for inflation.

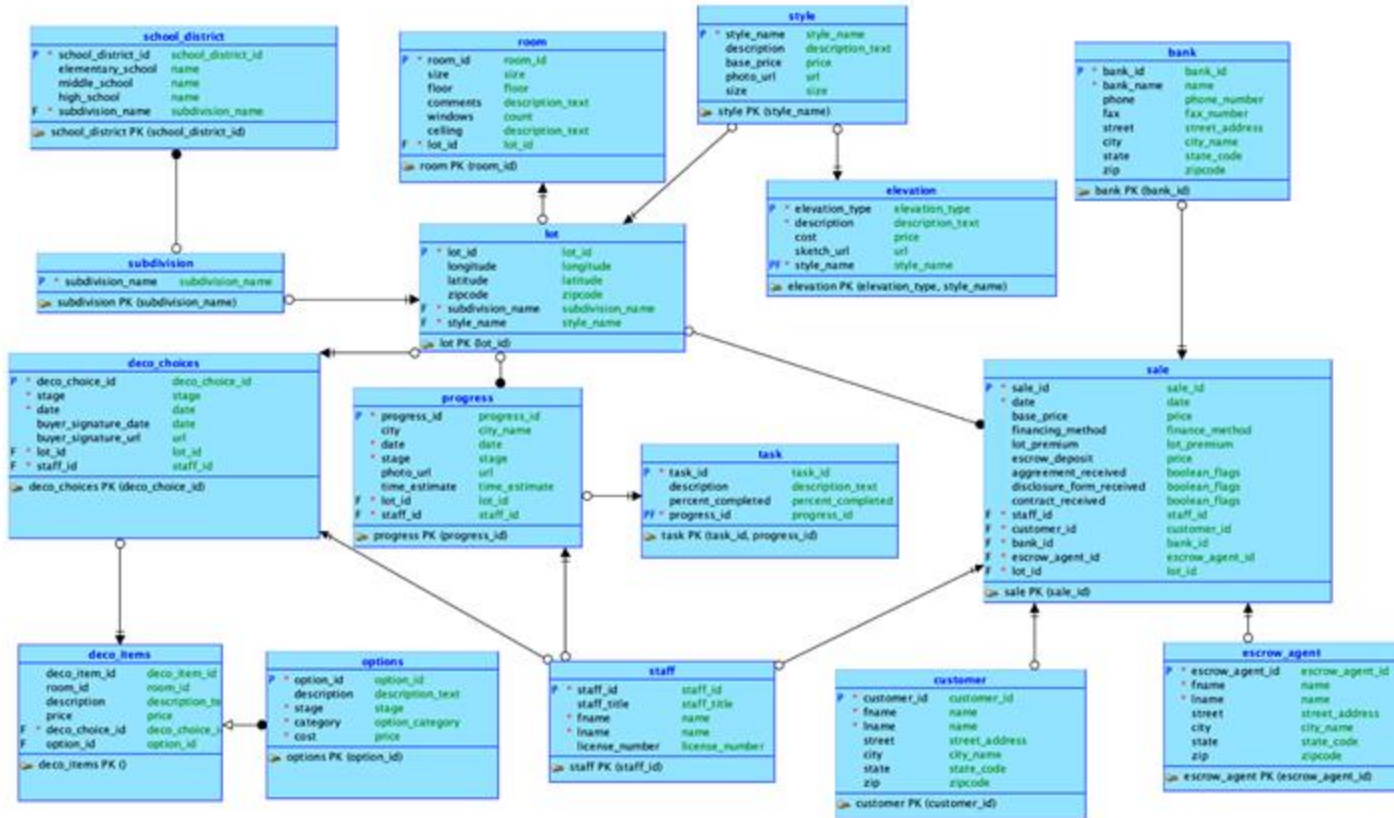
## 4. Escrow

- a. Escrow is a neutral third party that manages the transaction among customers, bank and sale and make sure the contractual obligations are fulfilled by all parties. .

# Assumptions

- **Subdivision style:** Each subdivision has a specific house style assigned to every lot.
- **Elevation:** Each style has distinct exterior variations known as elevations, which are dependent on the style; clients can choose one elevation per style.
- **Construction progress table:** There is only one construction progress table associated with each lot ID.
- **Cost equals price:** The cost is assumed to be equal to the price, including any additional charges.
- **Lot premiums:** Lot premiums are considered attributes for each sale record, as they are negotiable factors in determining the final price.
- **Base price:** The base price is confirmed only after the client discusses their chosen elevation with the sales representative; thus, the base price is not an inherent attribute of the lot itself and is treated as a column in the sales table.

# Logical Model ERD



# Entities Description –1

- **Subdivision** refers to a parcel of land that has been divided into smaller lots for the purpose of development, construction, or sale.
- **School district** is a specific geographic area that is established to provide and manage public education for students within that region, such as elementary, middle and high school.
- A **lot** represents a parcel of land within a subdivision.
- **Style** refers to the architectural design and aesthetic features of a house or residential building. It encompasses various elements such as the shape, layout, materials, and decorative features of a house.
- A **room** is a defined space within a building, typically enclosed by walls, a floor, and a ceiling. Rooms serve various purposes and can vary in size, shape, and function.
- **House elevation** refers to the architectural drawing or representation that shows one side of a house, typically illustrating its design, proportions, and features.

# Entities Description –2

- **Decorator choices** represents design decisions made by the client during the construction stage.
- **Decorator items** refer to various elements and accessories used in interior design and home décor to enhance the aesthetic appeal and functionality of a space.
- **Options** is an exterior option that the client chose for the decorator choice.
- **Construction progress** is used by construction managers to track the progress of each house and evaluate the work crews based on that progress.
- **Task** is the major task remaining for the current stage in the construction progress.
- **Sales** is more like an initial contract for the sale of a house that includes important information, such as details of house and lots and customer's information and bank payment etc.

# Entities Description –3

- **Banks** play several crucial roles, primarily related to financing, transactions, and financial services, in this context, more related to housing transactions such as mortgages.
- The **staff** here mainly indicates staff including in the process, such as sales representative, construction managers and employees in the decorator choices.
- A **customer**'s entity refers to clients who signed the initial contract for the sale of a house.
- **Escrow\_agent** is a neutral third party who handles the financial aspects of the sale.



# Feature List

- Sequences(2)
- Views(2)
- Procedures(2)
- Functions(1)
- Package(1)
- Database Triggers(2)
- Scheduled Jobs (1)
- Index(1)

# Features: Sequence

- **Surrogate Key for Subdivision - subdivision\_sequence**

The subdivision sequence is created to facilitate the generation of the surrogate key for subdivisions in the subdivisions table.

- **Surrogate Key for Style - style\_sequence**

Similar to the subdivision table, the style sequence is created to facilitate the generation of the surrogate keys for the styles in the style table.

# Features: Views

- **View of near-finish properties - near\_finish\_properties**

This is a view to help the company prepare for the delivery of construction properties. It lists the properties that are estimated to finish its construction in 30 days.

- **Views of popular decoration options - popular\_deco\_options**

This is a view to help the business analytics of the eggshell company. It aggregates and lists the decoration options popular among its customers, calculated by the number of times the option was selected by customers.

# Features: Procedures

- **Update construction progress - update\_construction\_progress**

The procedure is used to update construction progress for the company's properties. This is executed when construction managers or staff check-in at construction sites and report back the newest statistics and information about the progress.

- **Addition of subdivision - add\_subdivision**

This procedure is designed to work with the surrogate key subdivision\_id and the sequence subdivision sequence.

# Features: Function

- **Calculation of the total sales price - calculate\_total\_sale**

This function calculates the total sales amount associated with each sale. For each sale, the function calculates the sum of base price and lot premium to output the total sales price.

# Features: Package

- **The database package - egg\_shell\_package**

This is the package used for the eggshell database, containing the two procedures (update\_construction\_progress and add\_subdivision) and one function (calculate\_total\_sale). Objects in this package are used for eggshell's daily operations.

# Features: Database Triggers

- **Construction Progress Update - log\_lot\_progress\_update**

This is a helper trigger to show and help log the updates on construction progress. Every time an update is made on construction progress, the trigger is executed to print out a message informing the user logging information, which include the lot number of interest, the original stage, and the new stage, as well as the time of the update.

- **Subdivision Duplicate Check - no\_dup\_subdivision**

This trigger is executed when inserting new subdivisions into the subdivision table. If a subdivision with that name already exists, the trigger will raise an application error to warn the user the name exists.

# Features: Database Role 1

- Sales Agent - sales\_agent\_role

Table	<i>SELECT</i>	<i>INSERT</i>	<i>UPDATE</i>
sale	✓	✓	✓
bank	✓		
customer	✓	✓	✓
lot	✓		
elevation	✓		
options	✓		
style	✓		
subdivision	✓		
school_district	✓		



# Features: Database Role 2

- Construction Manager - construction\_manager\_role

Table	<i>SELECT</i>	<i>INSERT</i>	<i>UPDATE</i>
sale	✓		
customer	✓		
lot	✓		
elevation	✓		
style	✓		
subdivision	✓		
deco_choices	✓		
deco_items	✓		
options	✓	✓	✓
progress	✓	✓	✓
task	✓	✓	✓

# Features: Alternate Index

- **Customer full name index - customer\_name\_idx**

This alternate index is created for the combination of customer first name and customer last name. Given that sales agents often look up customers by their full name rather than remembering their customer id, creating this alternate index will speed up the look up process and thus improve database performance.

# Report 1: Sales overview by customer

- This report helps us to see that for every customer, how many lots have been purchased, and how much money they spend on it.

	⚡ CUSTOMER_ID	⚡ FNAME	⚡ LNAME	⚡ TOTAL_SPENDING	⚡ PURCHASE_COUNT
1	C010	Emma	Vance	1005000	1
2	C009	JD	Moore	950000	1
3	C008	Obama	Wilson	895000	1
4	C007	James	Trump	840000	1
5	C006	Sophia	Wang	785000	1
6	C005	David	Chen	730000	1
7	C004	Emily	Harris	675000	1
8	C003	Michael	Brown	620000	1
9	C002	Kamala	Smith	565000	1
10	C001	John	Barack	510000	1

## Report 2: 2024 Commissioner by Staff

- This reports help us to see the commissioner each staff take from their 2024 sales, assuming the commission rate to be 1%

	STAFF_ID	STAFF_FIRST_NAME	STAFF_LAST_NAME	TOTAL_REVENUE	COMMISSION
1	S010	Alan	Walker	1005000	10050
2	S009	Amelia	Lee	950000	9500
3	S008	Karen	Lewis	895000	8950
4	S007	Laura	Davis	840000	8400
5	S006	Ben	Harris	785000	7850
6	S005	Chenkai	Lin	730000	7300
7	S004	Michelle	Wang	675000	6750
8	S003	Heng	Jiang	620000	6200
9	S002	Chris	Taylor	565000	5650
10	S001	Sarah	Ku	510000	5100

# Data Warehouse Migration

- **Fact Table:**

<b>Sales</b>
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- **Dimensional Table**

<b>Sales_details</b>	<b>Lot</b>	<b>Subdivision</b>	<b>Customer</b>	<b>Staff</b>	<b>Bank</b>	<b>Progress</b>
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**Thank you!**  
**Q&A**