
GOING SCHEMA-LESS:
HOW TO MIGRATE
A RELATIONAL DATABASE
TO A NOSQL
DATABASE
Product
Product_ID
Material_ID
Availability
Stock
Subcontractor_ID
Material
Material_ID
Material_Type
Availability
Stock
Subcontractor_ID
Subcont
Name
Address
Postal Code
Email
Event_ID
Location
Date
Address_ID
Tax
Date
Due Date

Who is Chad Green

Microsoft® MVP Most Valuable Professional

{Code PaLOUsa}
IT'S SOFTWARE DEVELOPMENT MADNESS

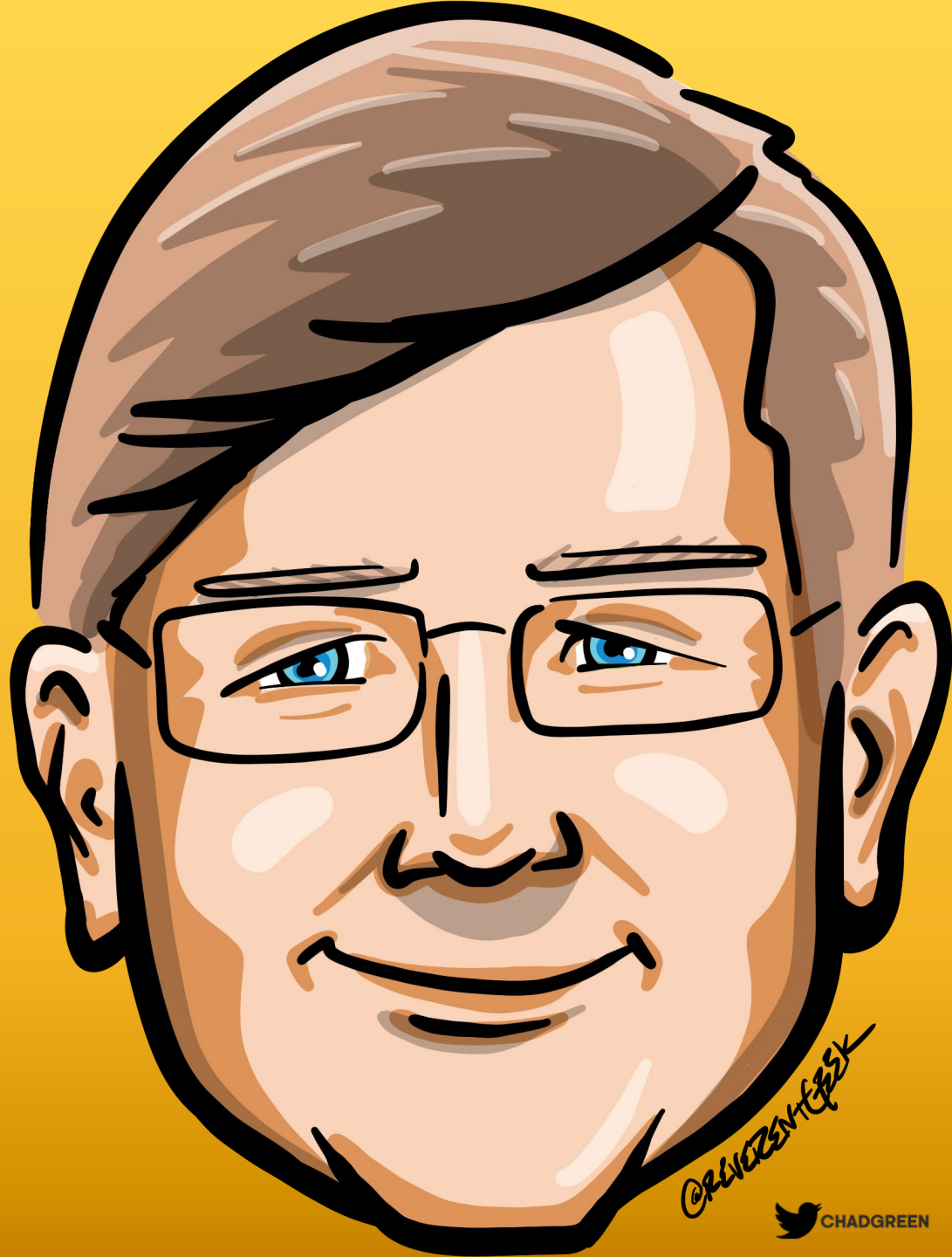
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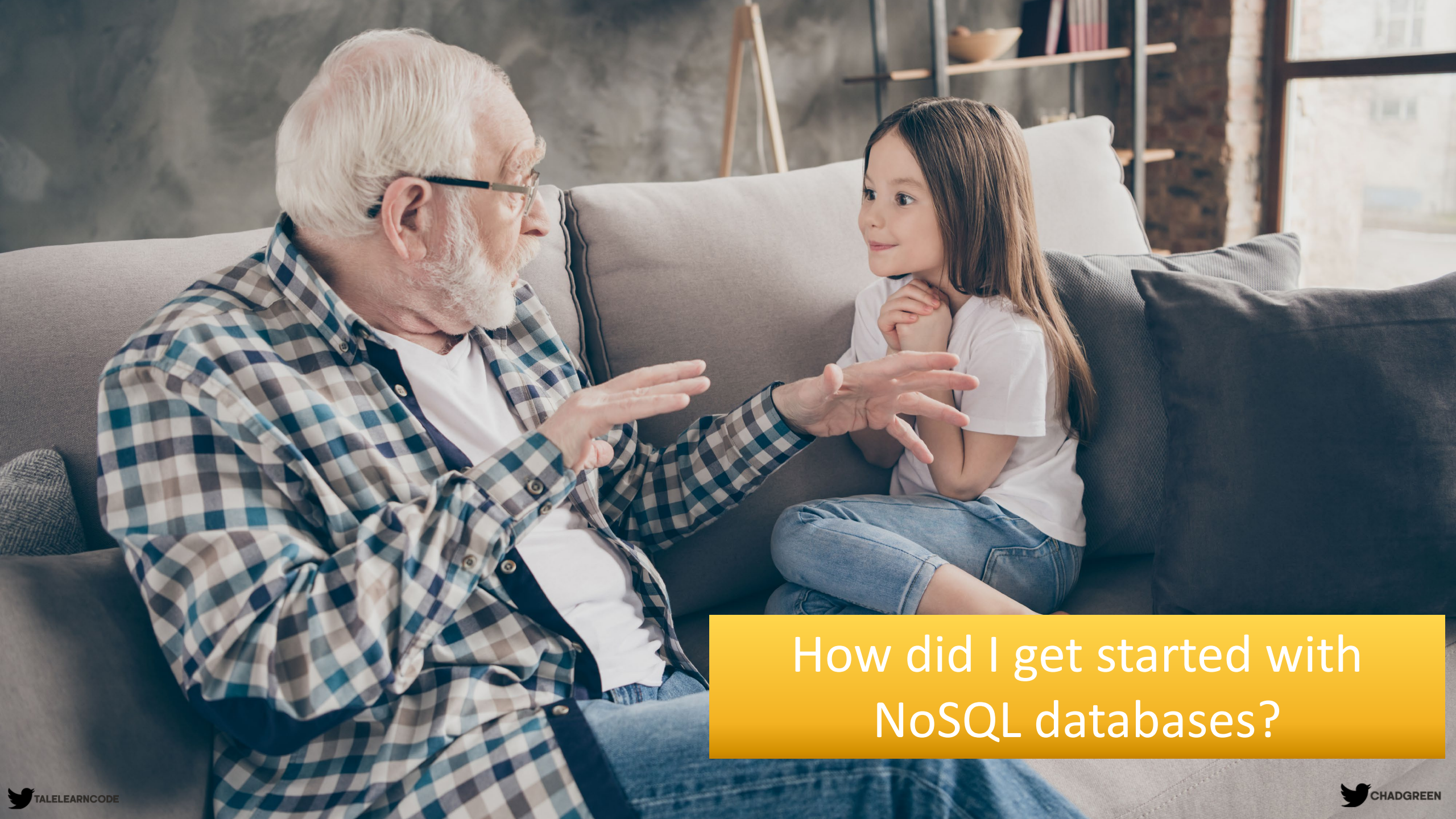
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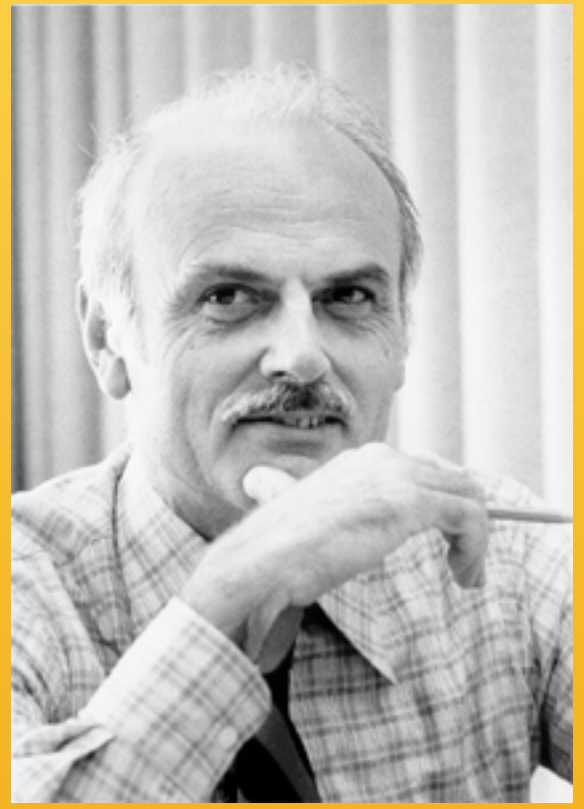



How did I get started with NoSQL databases?



What are Relational Databases

Relational Model



- First-order predicate logic
- Described by Edgar Codd in 1969
- Data represented in terms of tuples
- Purpose is to provide declarative method for specifying data and queries

Codd’s 12 Rules

0: Foundation Rule

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1: Information Rule

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7: Possible for high-level insert, update, and delete

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9: Logic data independence

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10: Integrity Independence

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- 10: Integrity Independence
- 11: Distribution Independence

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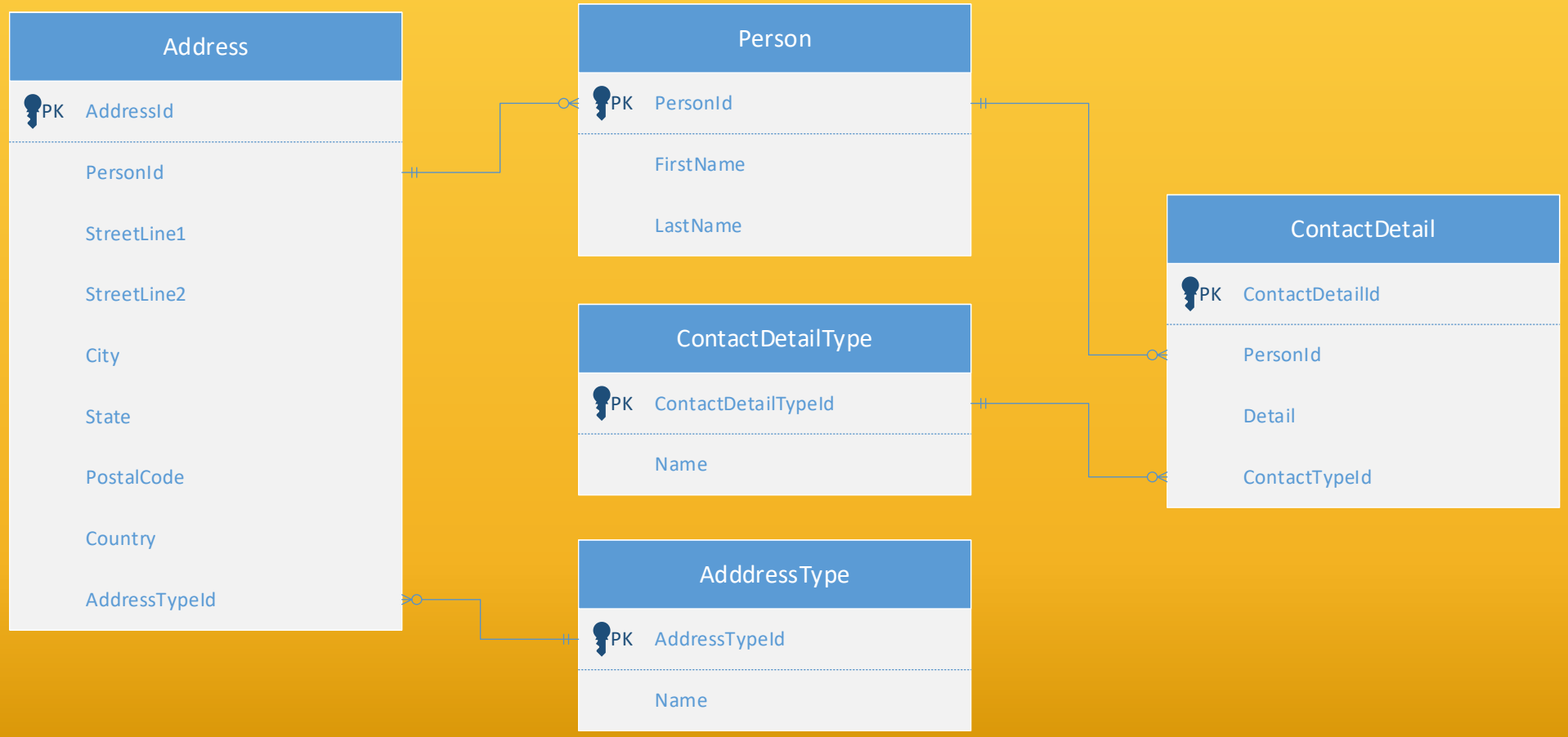
9: Logic data independence

10: Integrity Independence

11: Distribution Independence

2: Nonsubversion Rule

Typical Relational Model



True star of Relational Databases

SQL

Structured Query Language

SEQUEL

True star of Relational Databases

SC

Structured



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Big Names in Relational Databases















What are NoSQL Databases

What are NoSQL Databases

Modeled in means other than tabular relations

Existed since late 1960s

Increasingly used in big data and real-time web applications

NoSQL Motivations

Simplicity of Design

Simpler Horizontal Scaling

Finer Control over Availability
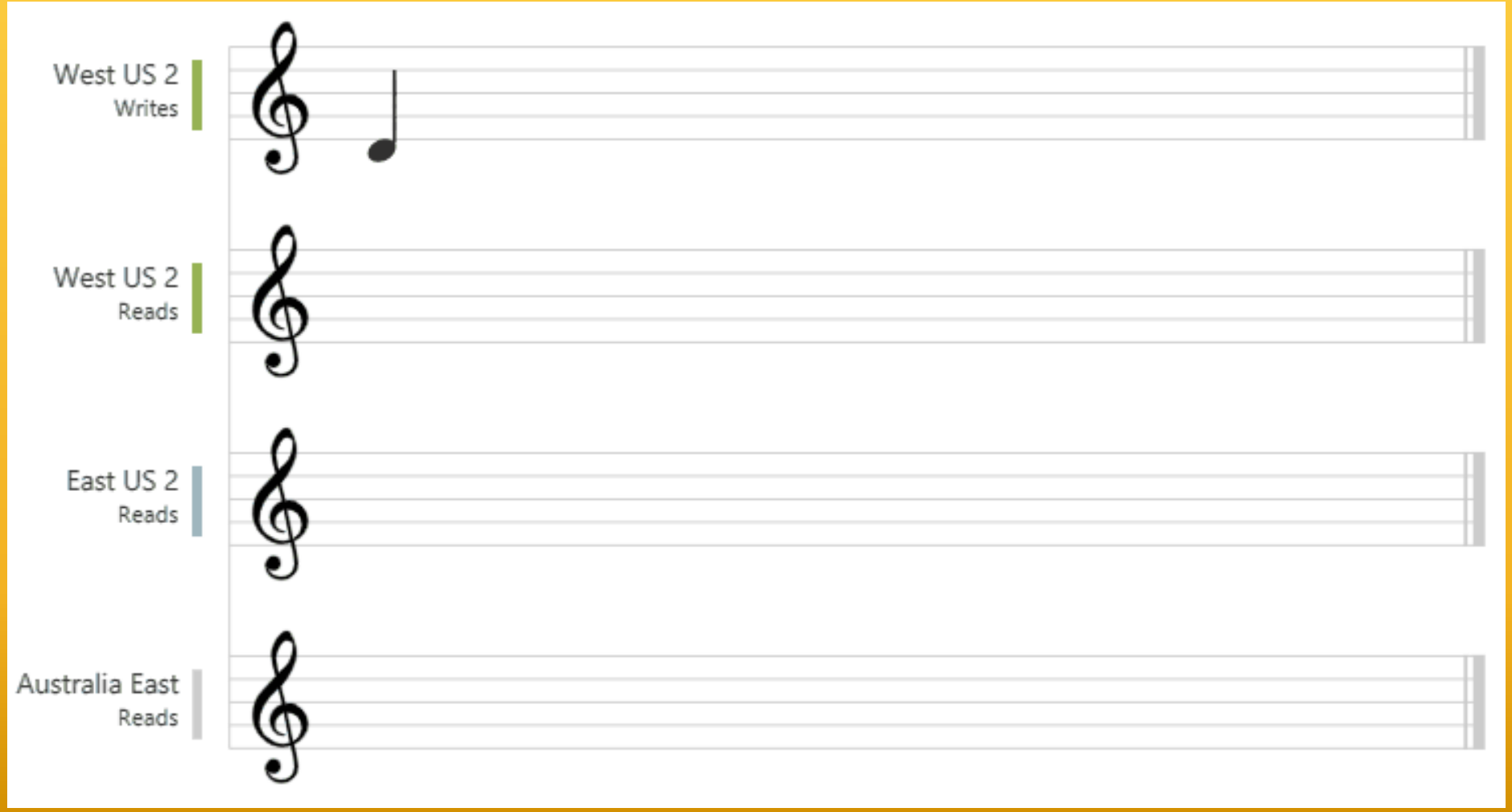
Limiting Object-Relational Impedance

Availability over Consistency

Relational
ACID Transactions

NoSQL
Eventual Consistency

Eventual Consistency



What’s in a Name

NoSQL

What’s in a Name

NoSQL

What's in a Name

Not only SQL

Non-SQL

Non-Relational

NoSQL

What's in a Name

Not only SQL

Non-SQL

Non-Relational

NoSQL

What's in a Name

No-Schema

Not only SQL

Non-SQL

Non-Relational

NoSQL

Many types of NoSQL databases





Couchbase

Document



CouchDB

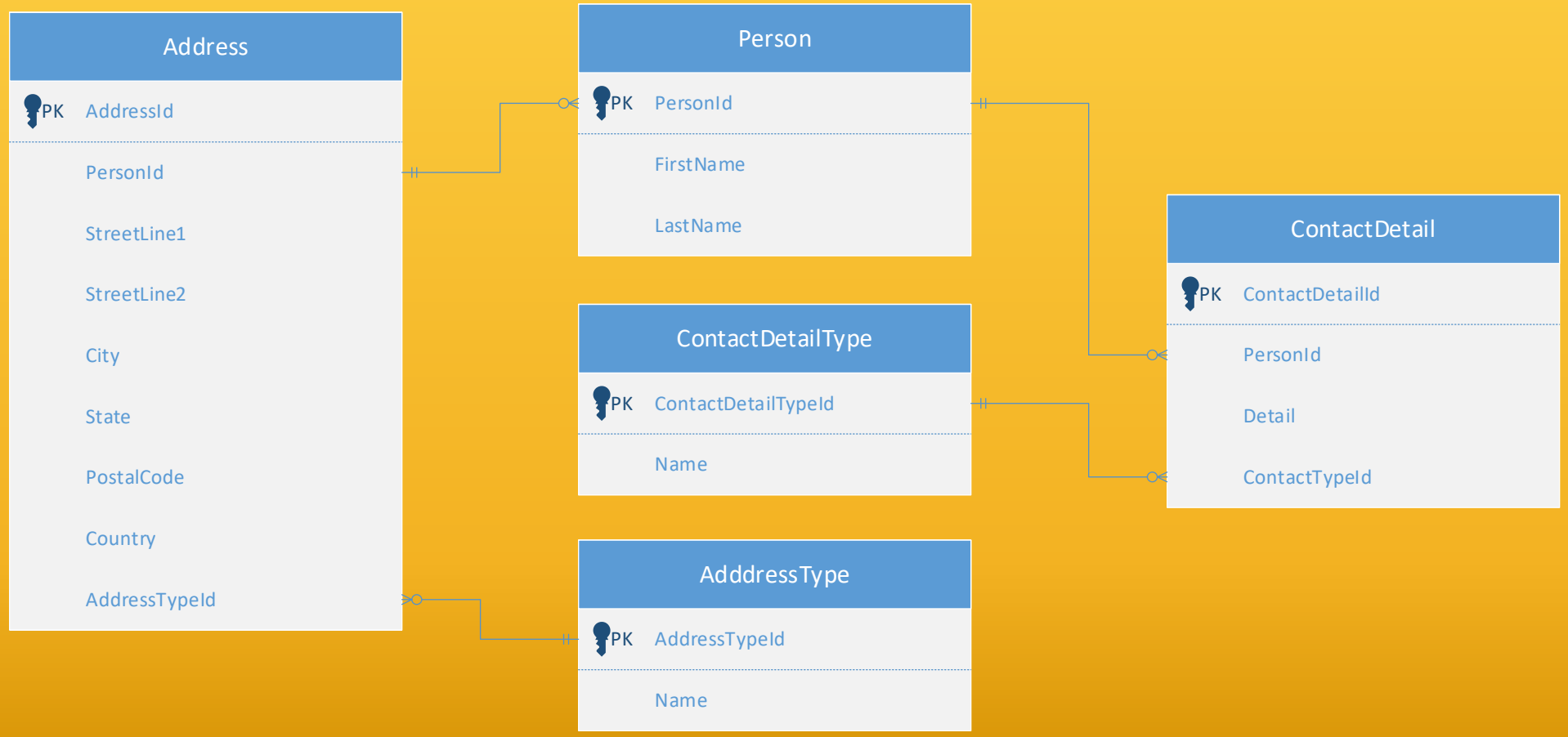


elastic



ArangoDB

Typical Relational Model



Same but in a document database

```
{
 "id": "1",
 "firstName": "Thomas",
 "lastName": "Andersen",
 "addresses": [
  {
   "city": "Seattle",
   "state": "WA",
   "type": {
    "name": "Primary"
   }
  }
 ],
 "contactDetails": [
  {
   "detail": "First Detail",
   "type": {
    "name": "A detail type"
   }
  }
 ]
}
```

Many types of NoSQL databases



Key-Value









Many types of NoSQL databases



Wide Column









Many types of NoSQL databases

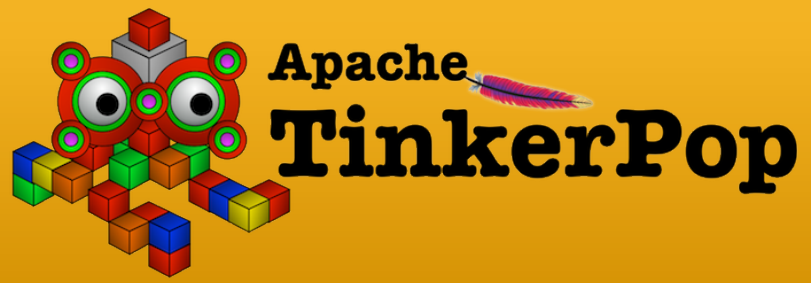


Graph

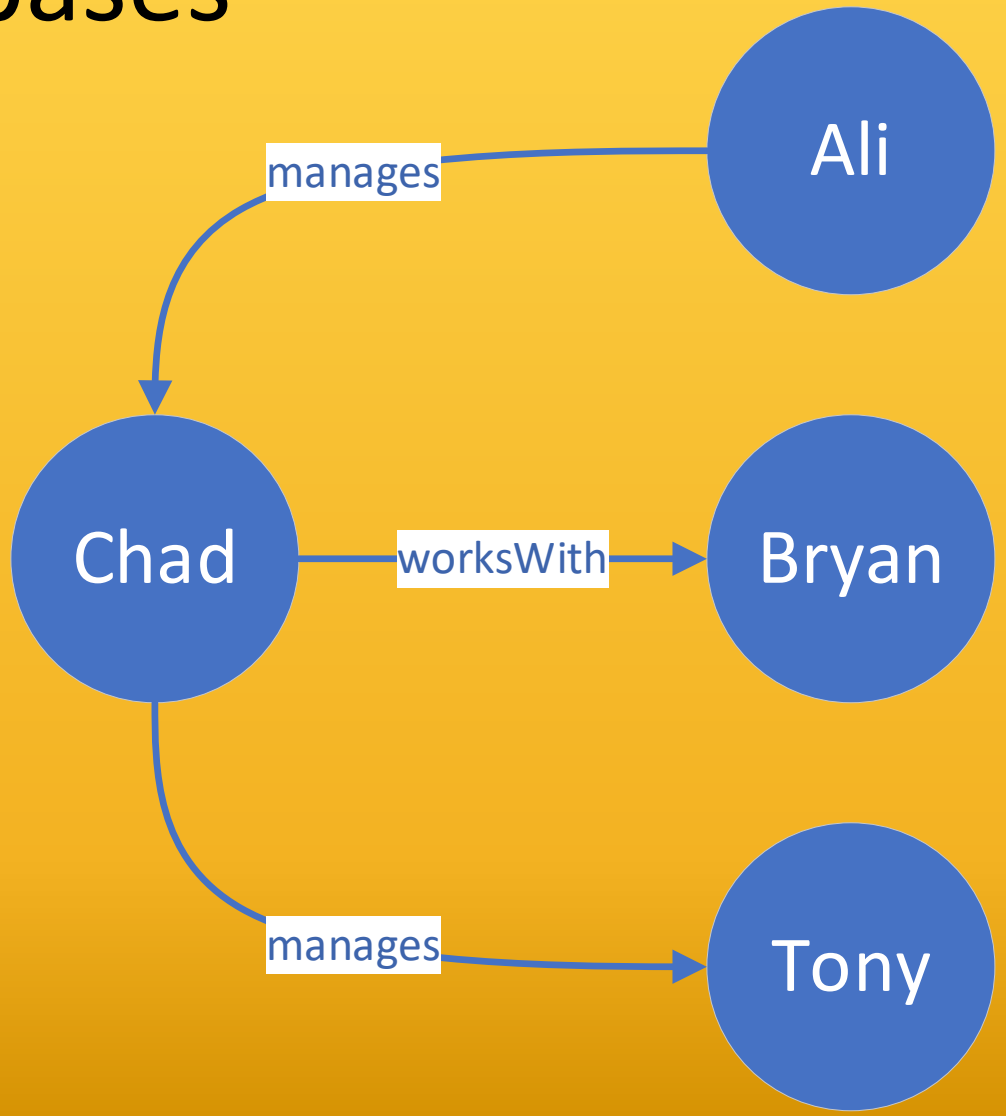








Graph Databases



Many types of NoSQL databases

Document

Key-Value

Wide Column

Graph

Object

Tabular

Tuple Store

Triple Store



Picking a Data Store

Data Model Comparison

Data Model	Performance	Scalability	Flexibility	Complexity	Functionality
Key-Value Store	High	High	High	None	Variable (None)
Column Store	High	High	Moderate	Low	Minimal
Document Store	High	Variable (High)	High	Low	Variable (Low)
Graph	Variable	Variable	High	High	Graph Theory
Relational	Variable	Variable	Low	Moderate	Relational Algebra

Things to think about

Skillset

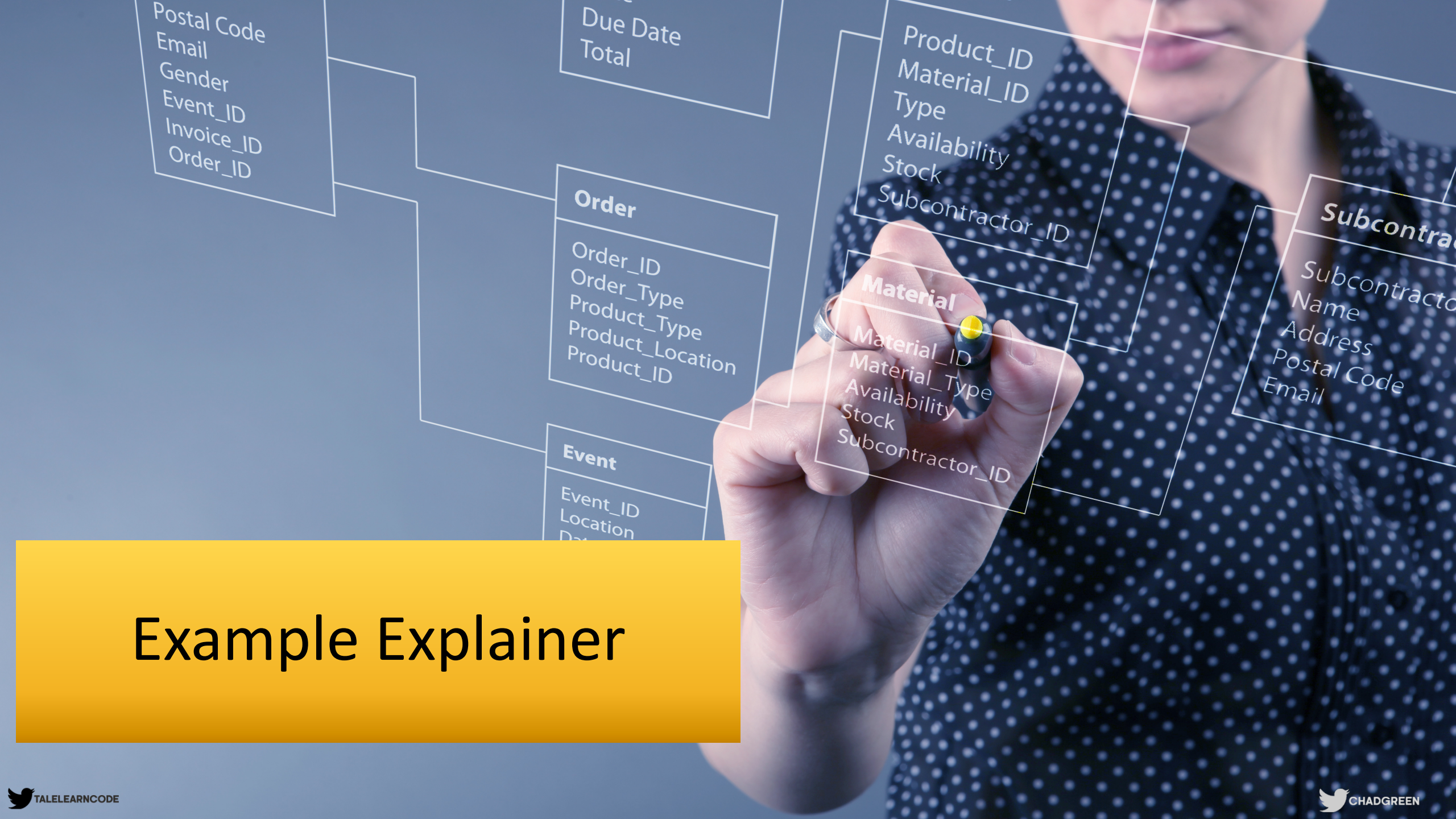
Time to Market

Known Data Structure

Scalability

Don’t forget

Hybrid



Example Explainer

Based on Real-World Project



Product & Pricing Management (PPM)

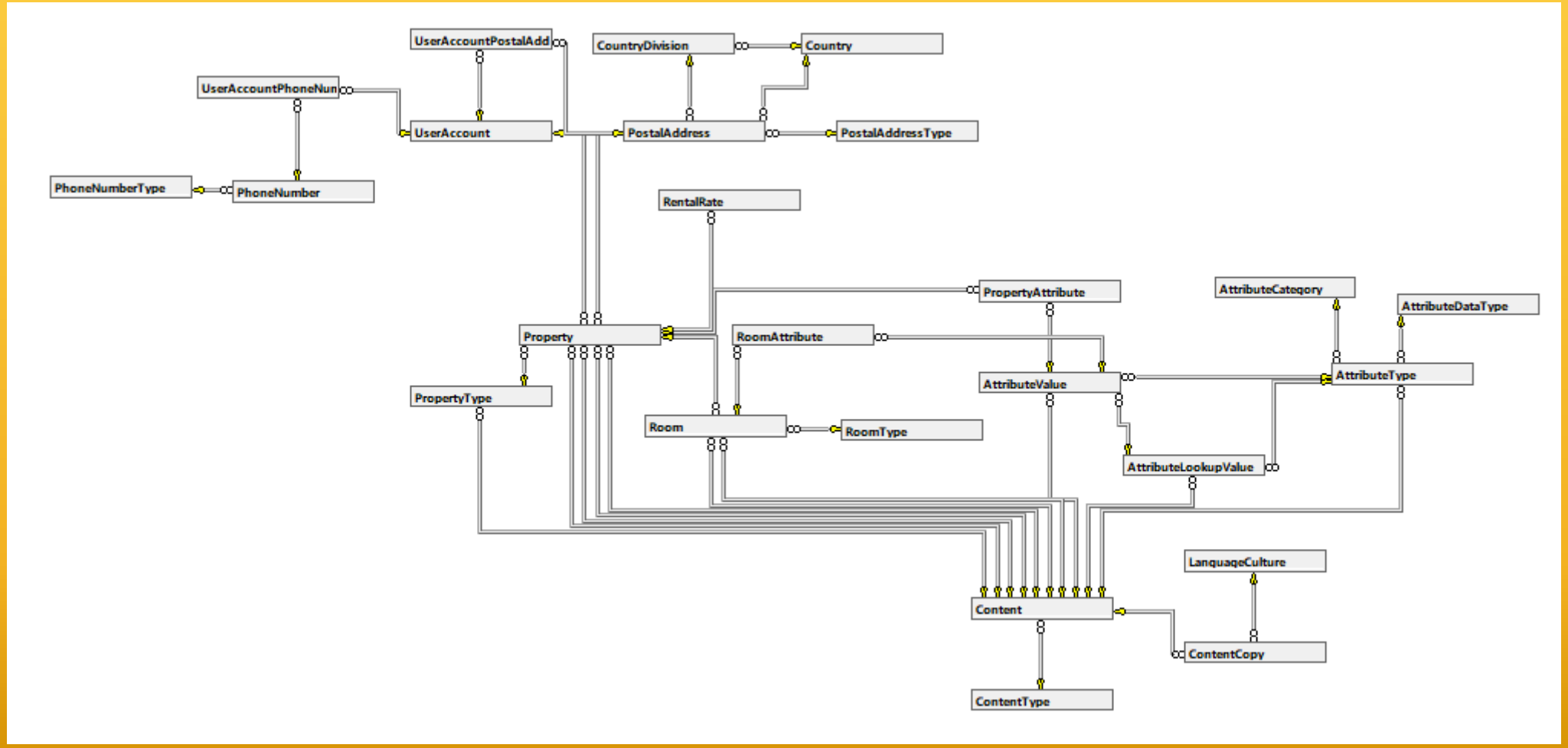
Vacation Rental Listing

- Allow property owners to list their vacation rentals
- Allow vacationers the ability to search for vacation rentals
- Provide vacationers with details of the properties
- Allow for configurable property/room attributes
- Localized versions of all the information

Data Model

- User Accounts
- Attributes
- Properties
- Reference Types
- Content
- Rooms

Relational Data Model



Real World: Why Relational

Skillset

Time to Market

Other Products

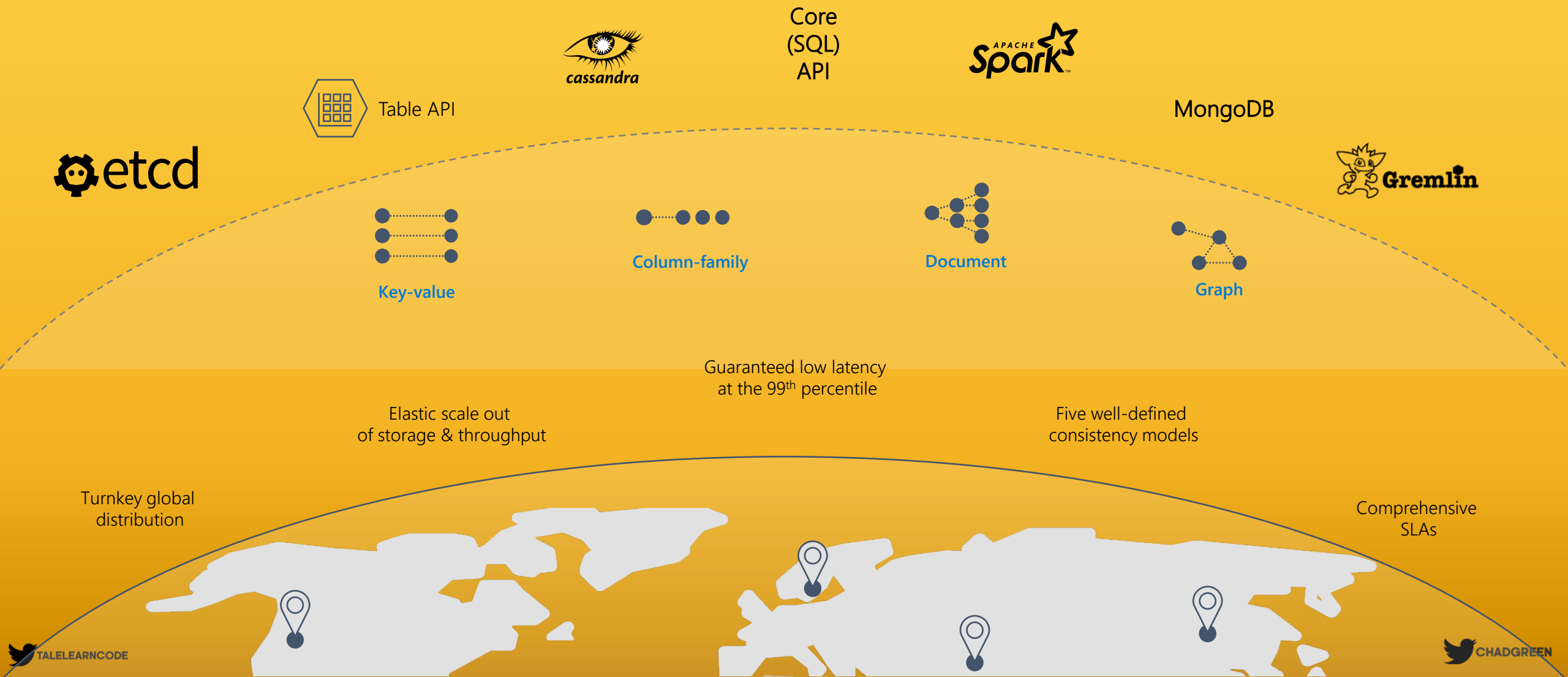
Issues Found in Real-World Project

- Searching against the attributes is difficult
- Navigation is deep



Very Quick Into to Cosmos DB

Azure Cosmos DB



Which Azure Cosmos DB Data API?

Core
(SQL)
API

Core (SQL) API

Which Azure Cosmos DB Data API?

Core (SQL) API



MongoDB

Which Azure Cosmos DB Data API?

Core (SQL) API





Table Storage

Which Azure Cosmos DB Data API?

Core (SQL) API







Gremlin

Which Azure Cosmos DB Data API?

Core (SQL) API







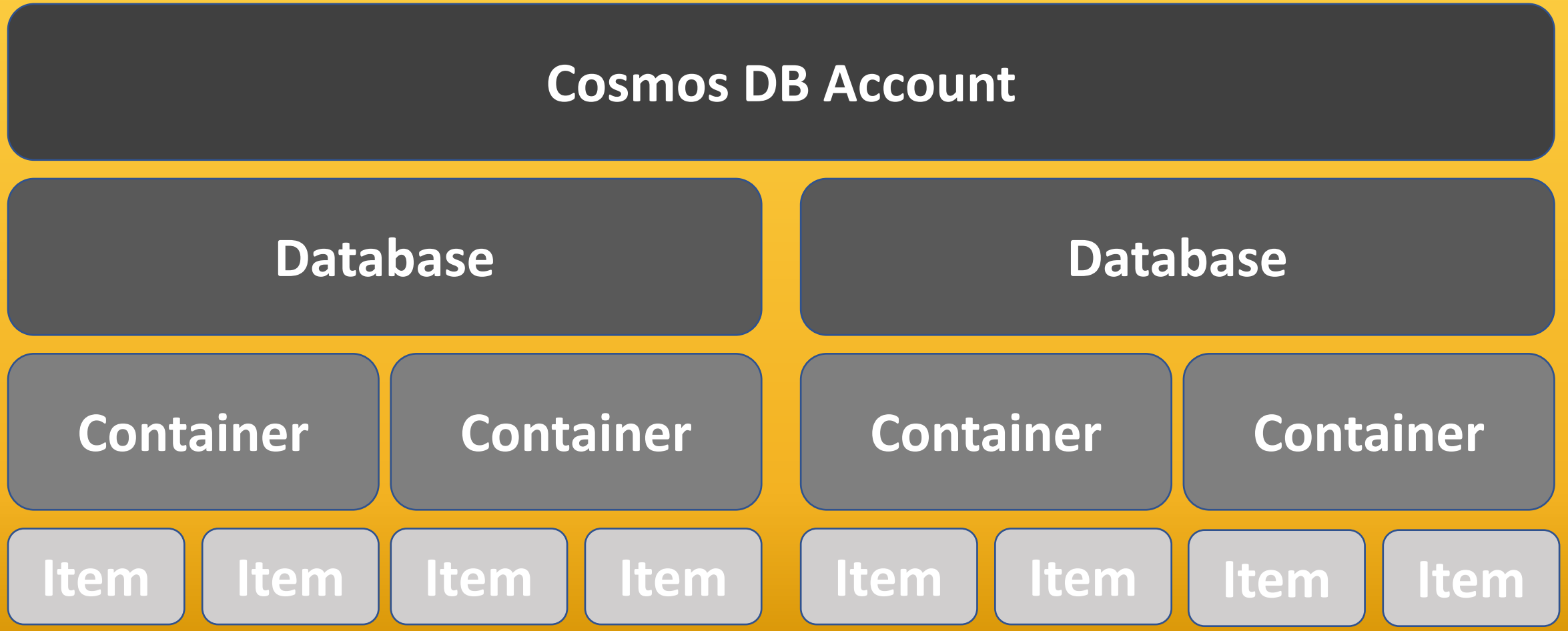


Cassandra



Migrating to NoSQL

Document Database Structure



Vacation Rentals Data Model

User Accounts

Attributes

Properties

Reference Types

Content

Rooms

Vacation Rentals Data Model

User Accounts
userAccountId

Attributes
attributeTypeId

Properties
propertyId

referenceTypeName
Reference Types

Content

Rooms

Vacation Rentals Data Model

User Accounts
userAccountId

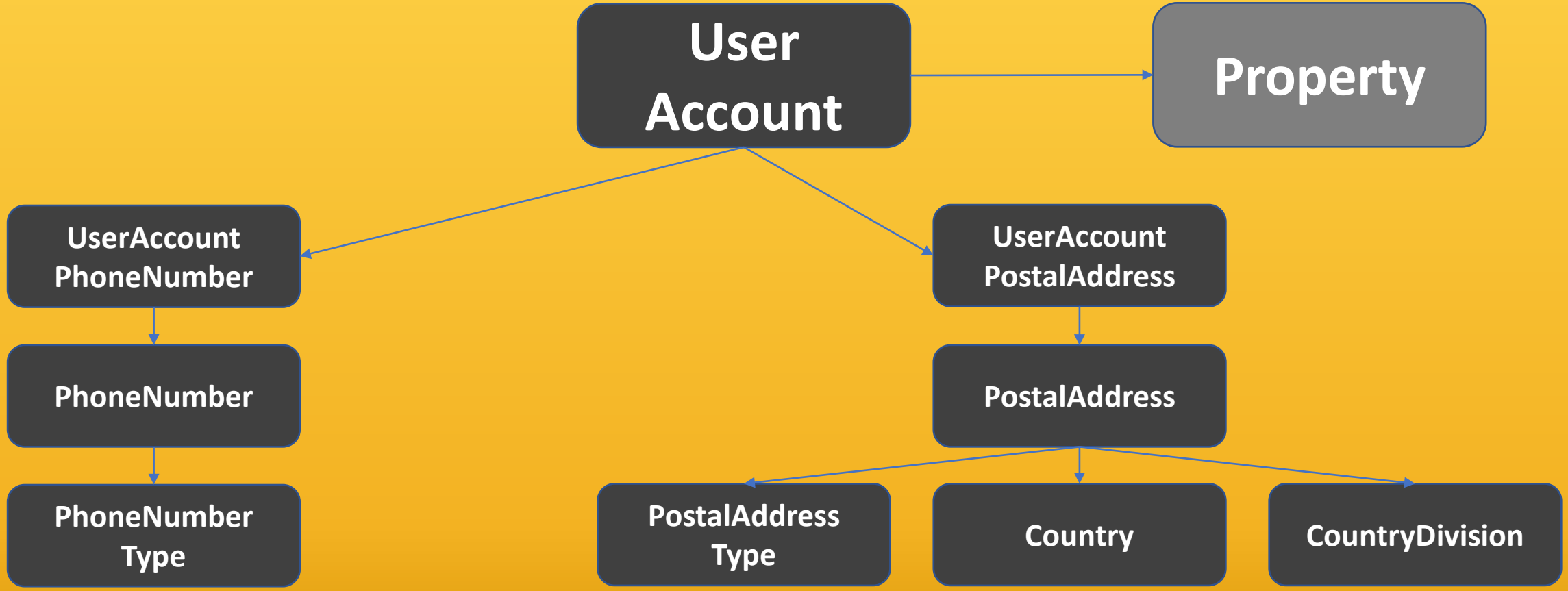
Attributes
attributeTypeId

Reference Types
referenceTypeName

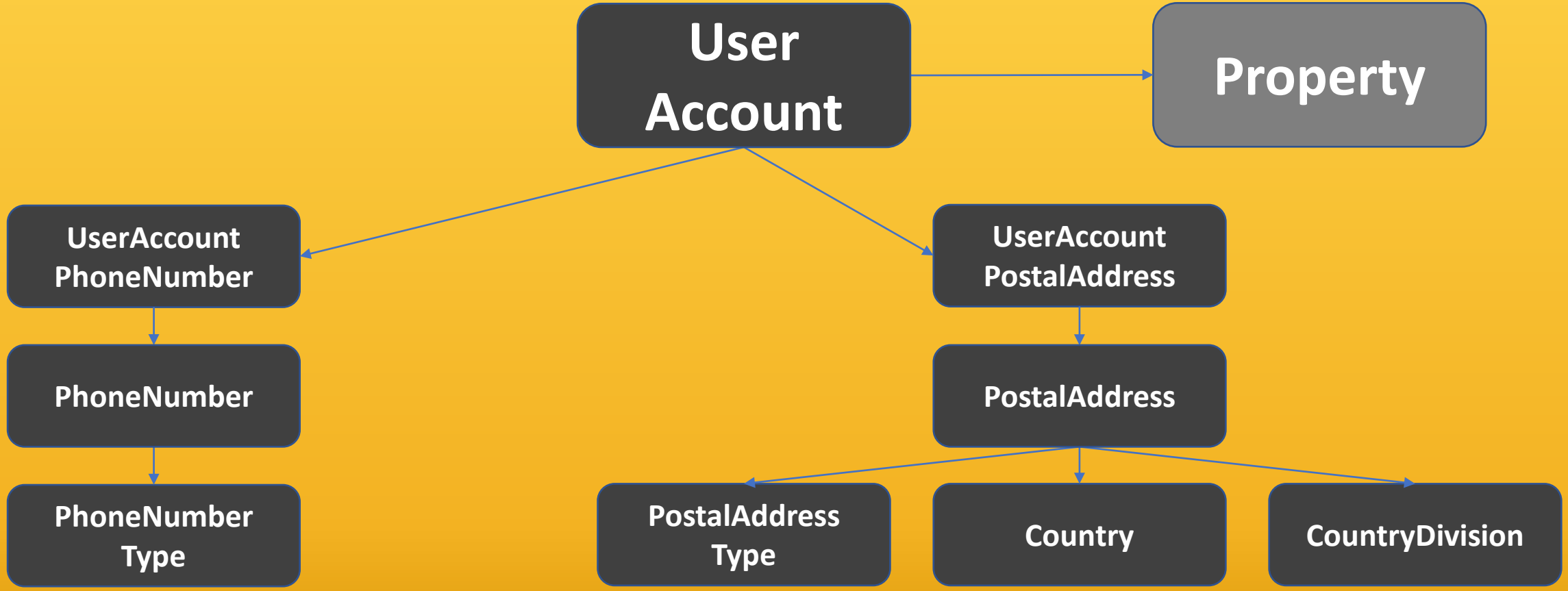
Properties
propertyId

Properties by Location
locationId

User Account Migration



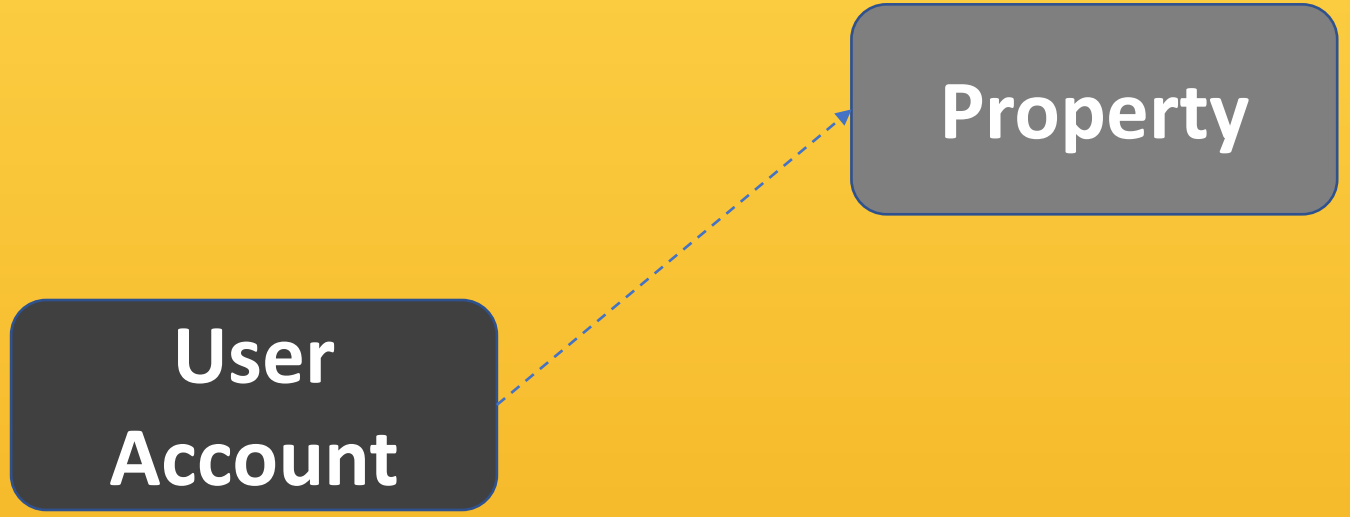
User Account Migration



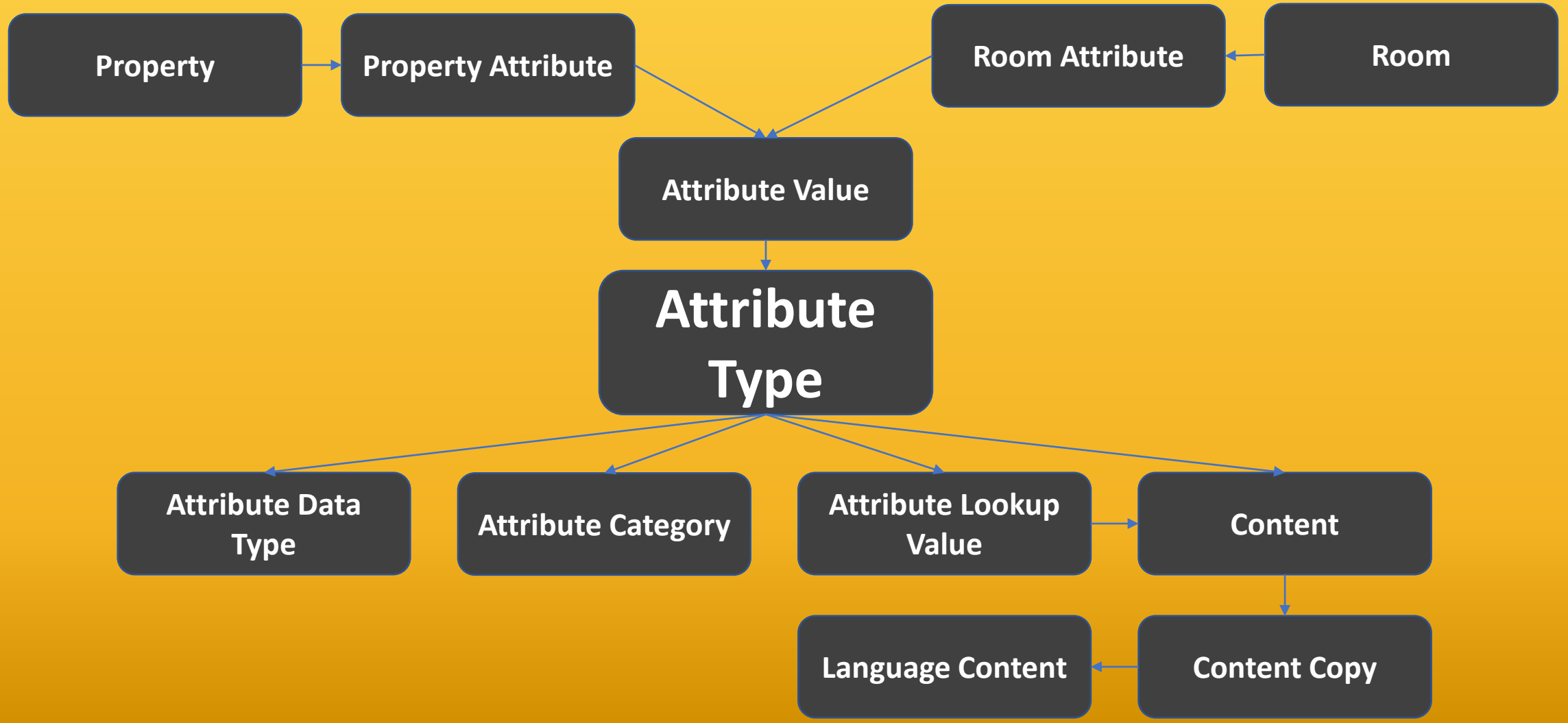
User Account Migration



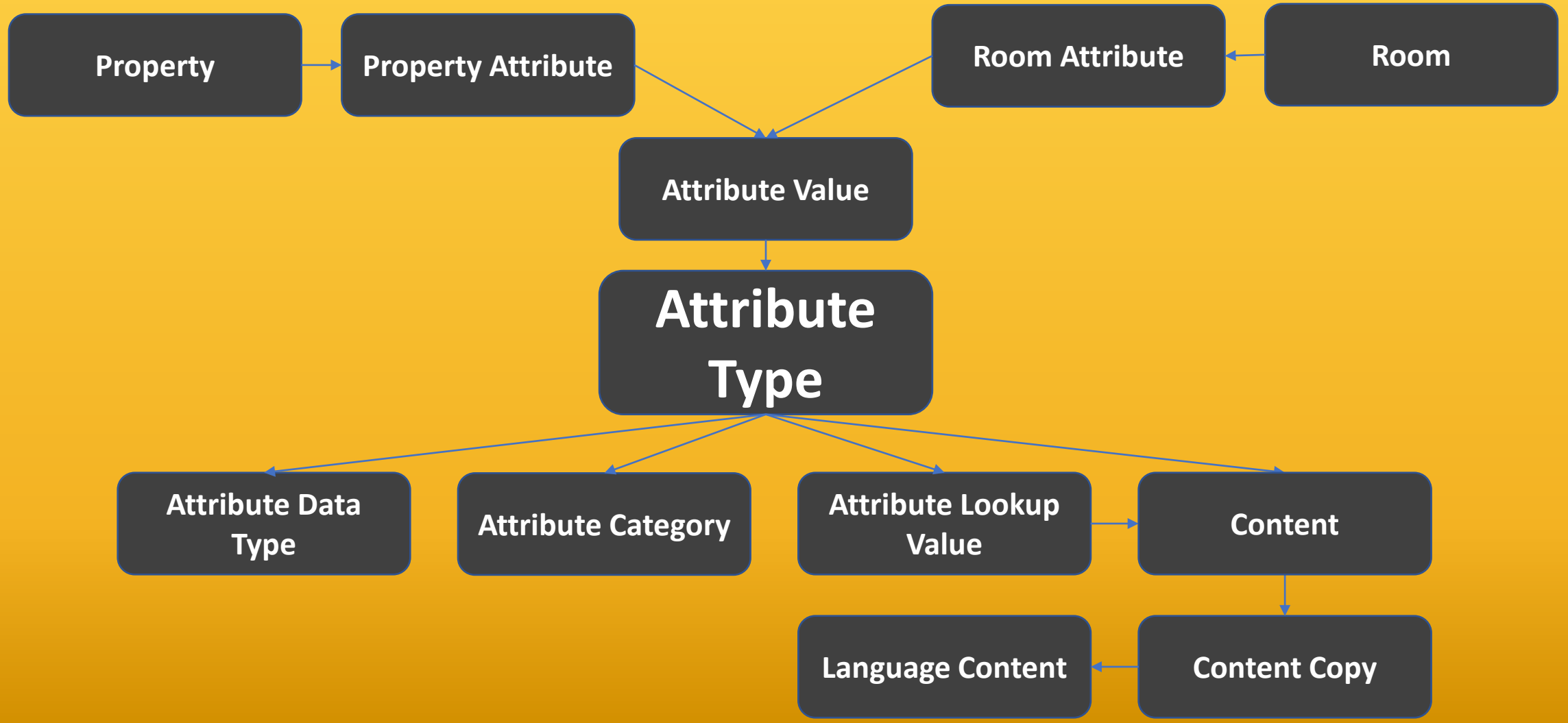
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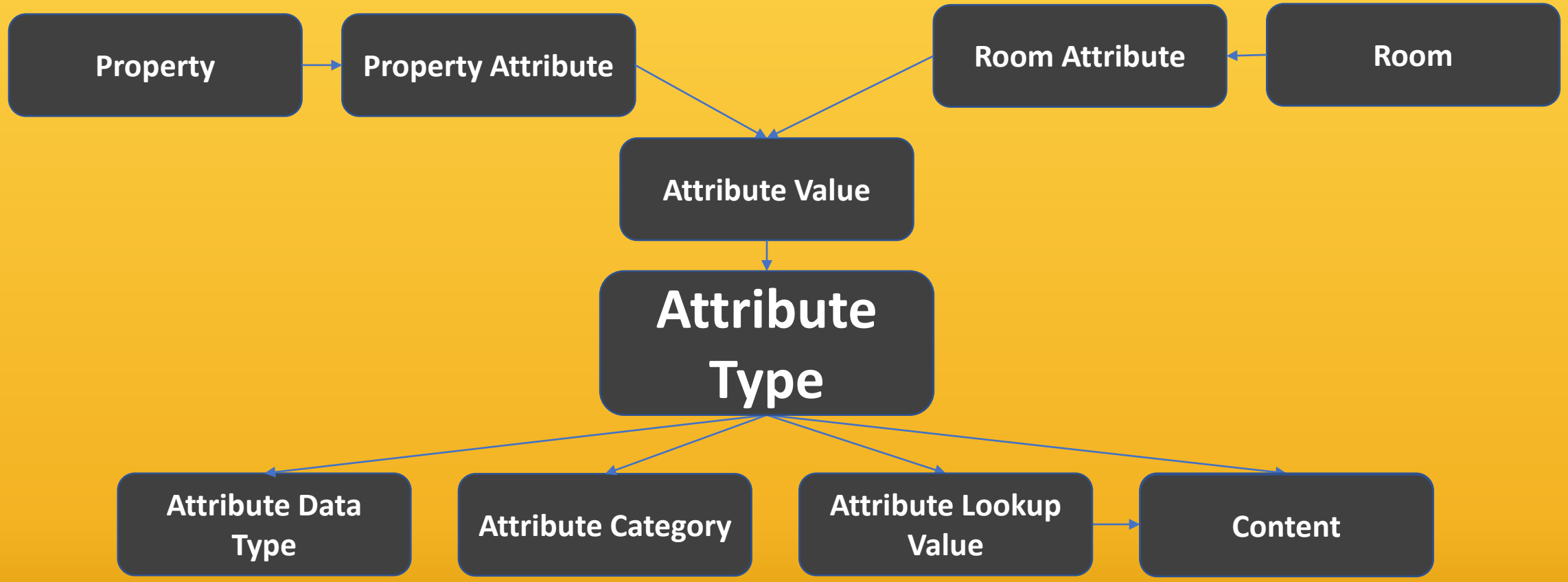
Attribute Migration



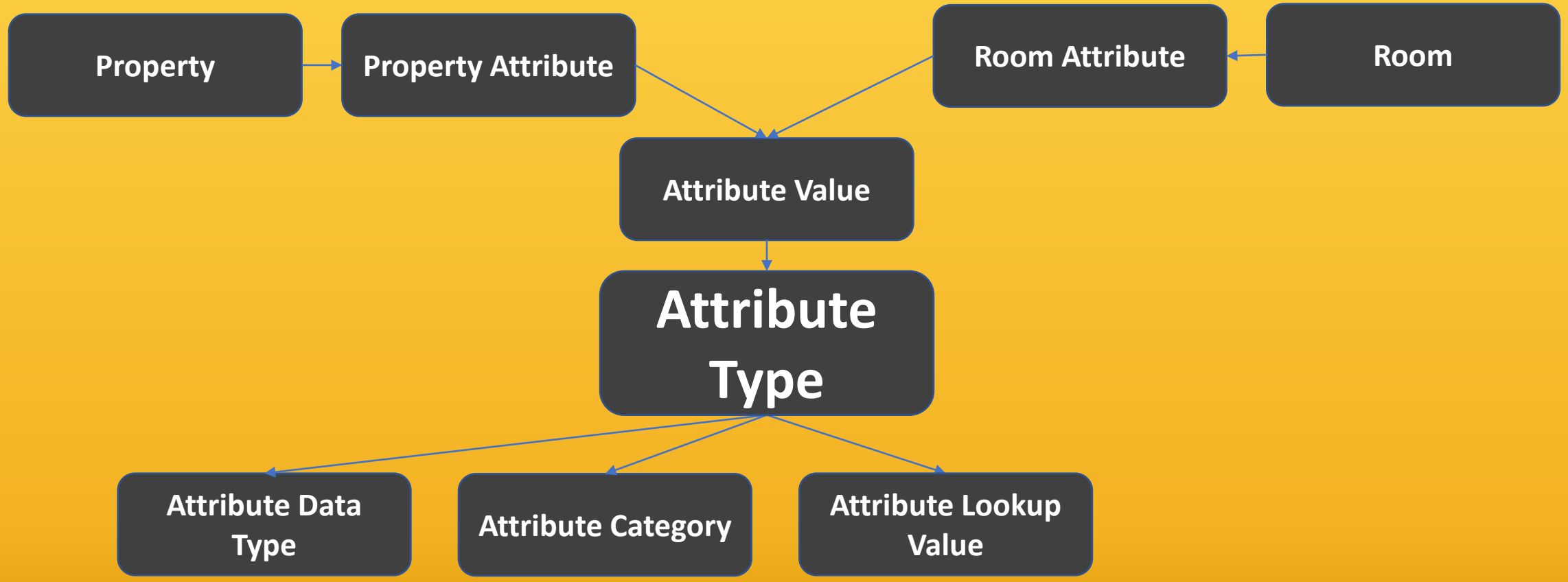
Attribute Migration



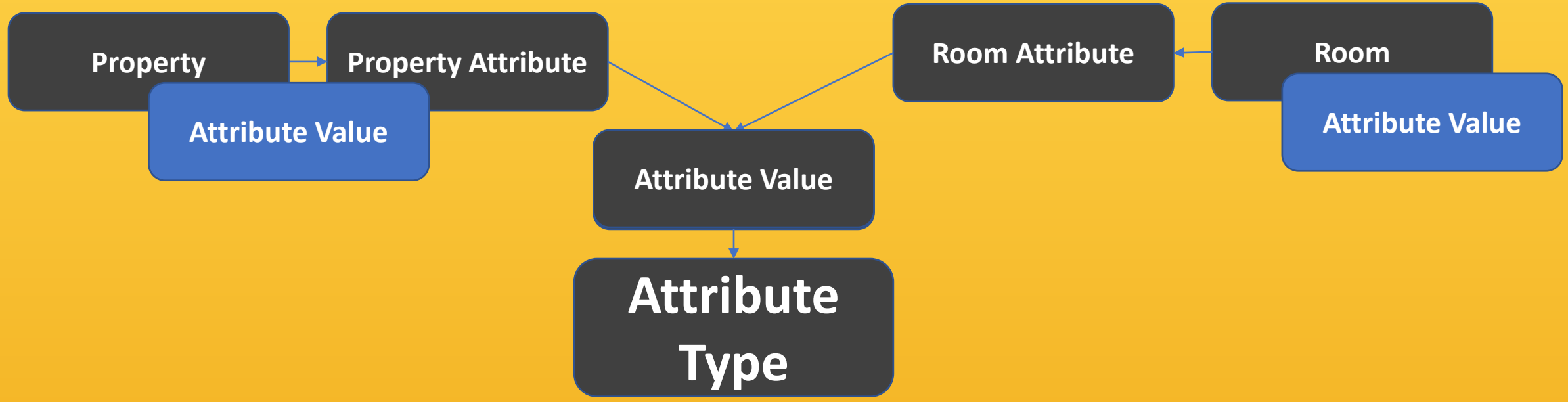
Attribute Migration



Attribute Migration



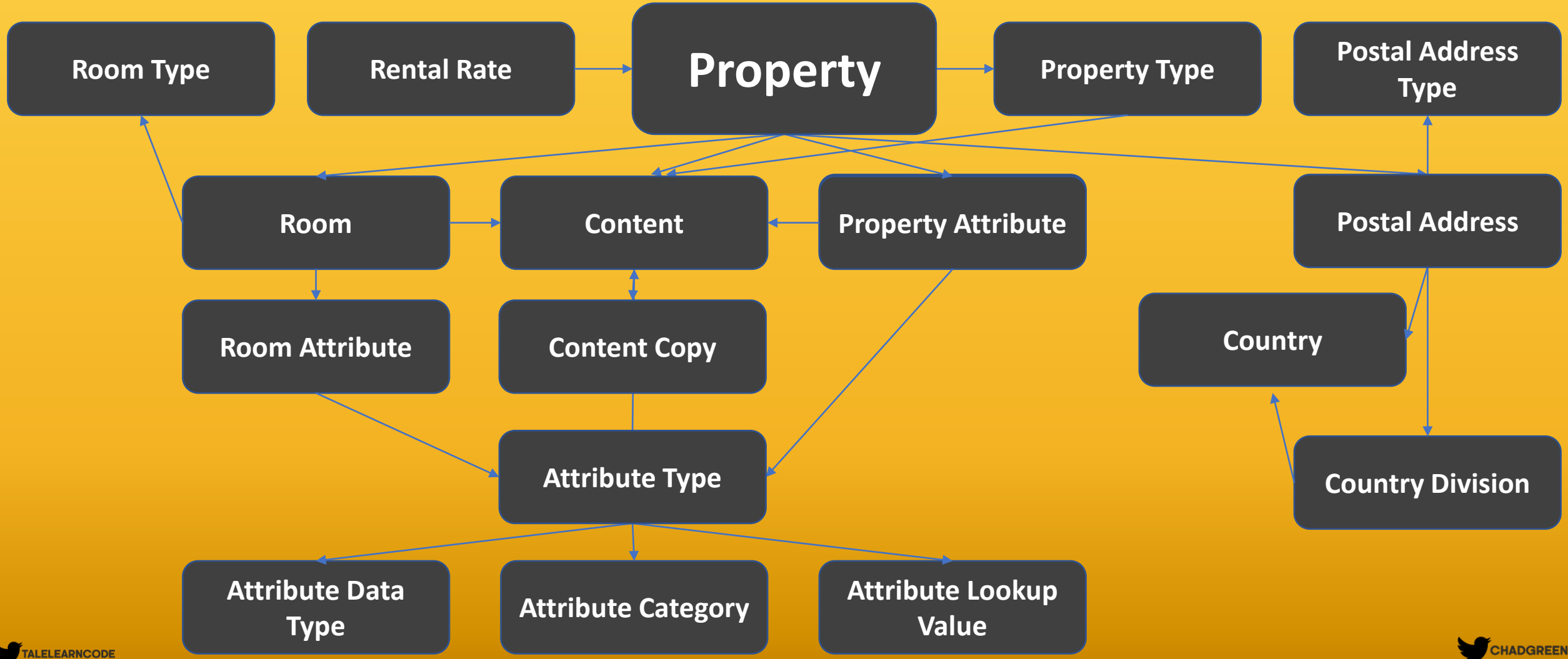
Attribute Migration



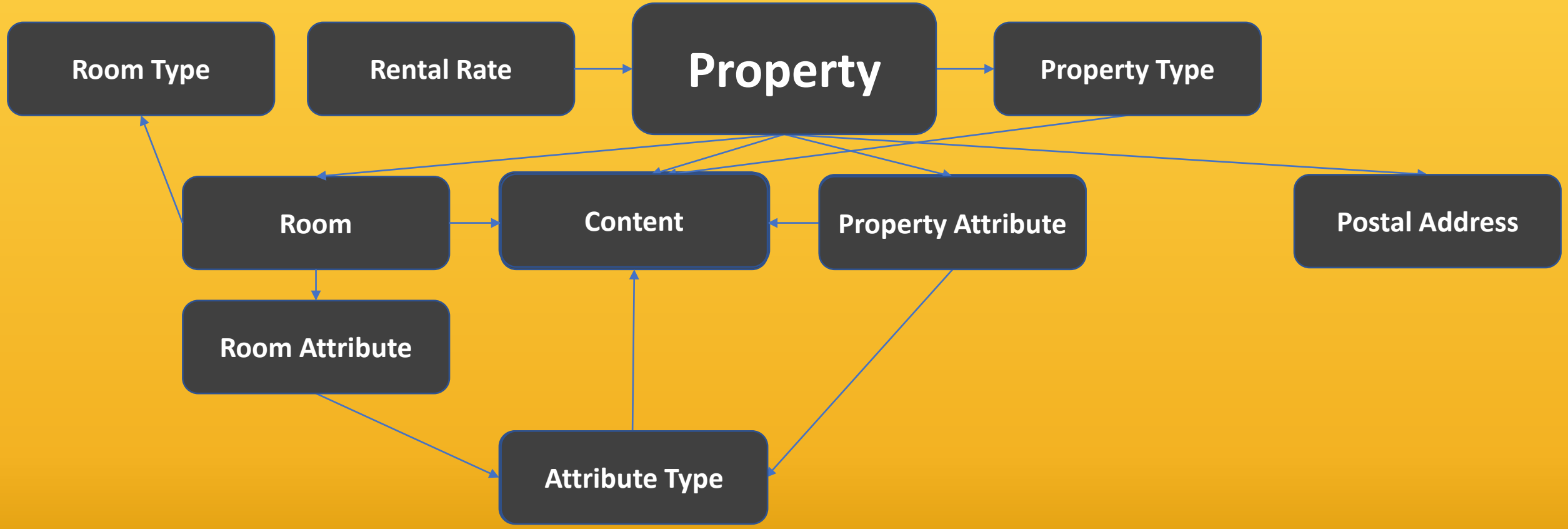
Attribute Migration



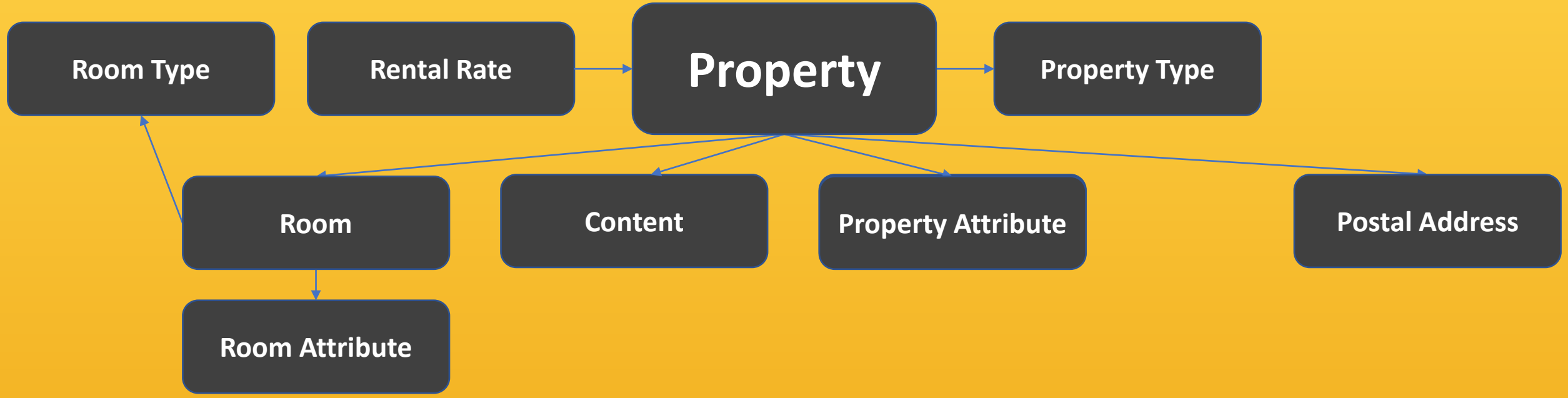
Property Migration



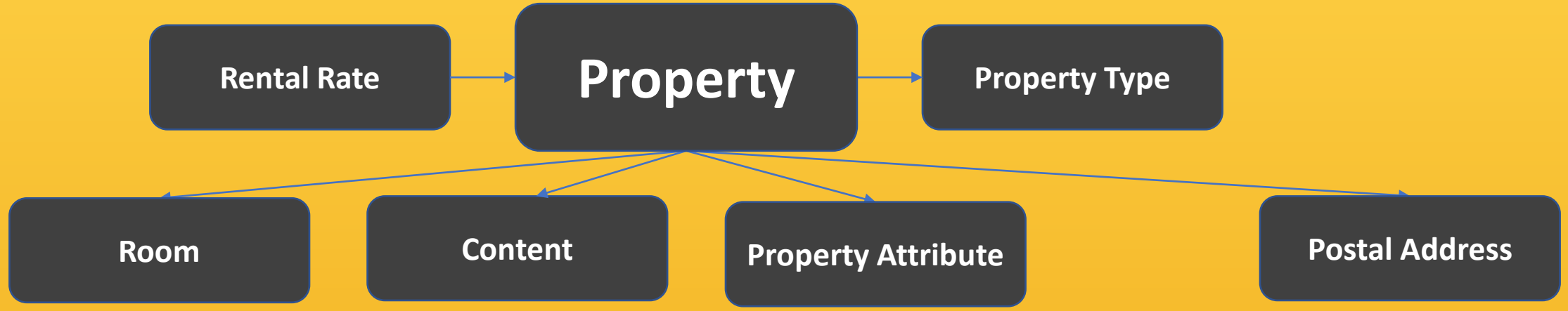
Property Migration



Property Migration



Property Migration



Property Migration



Property Migration



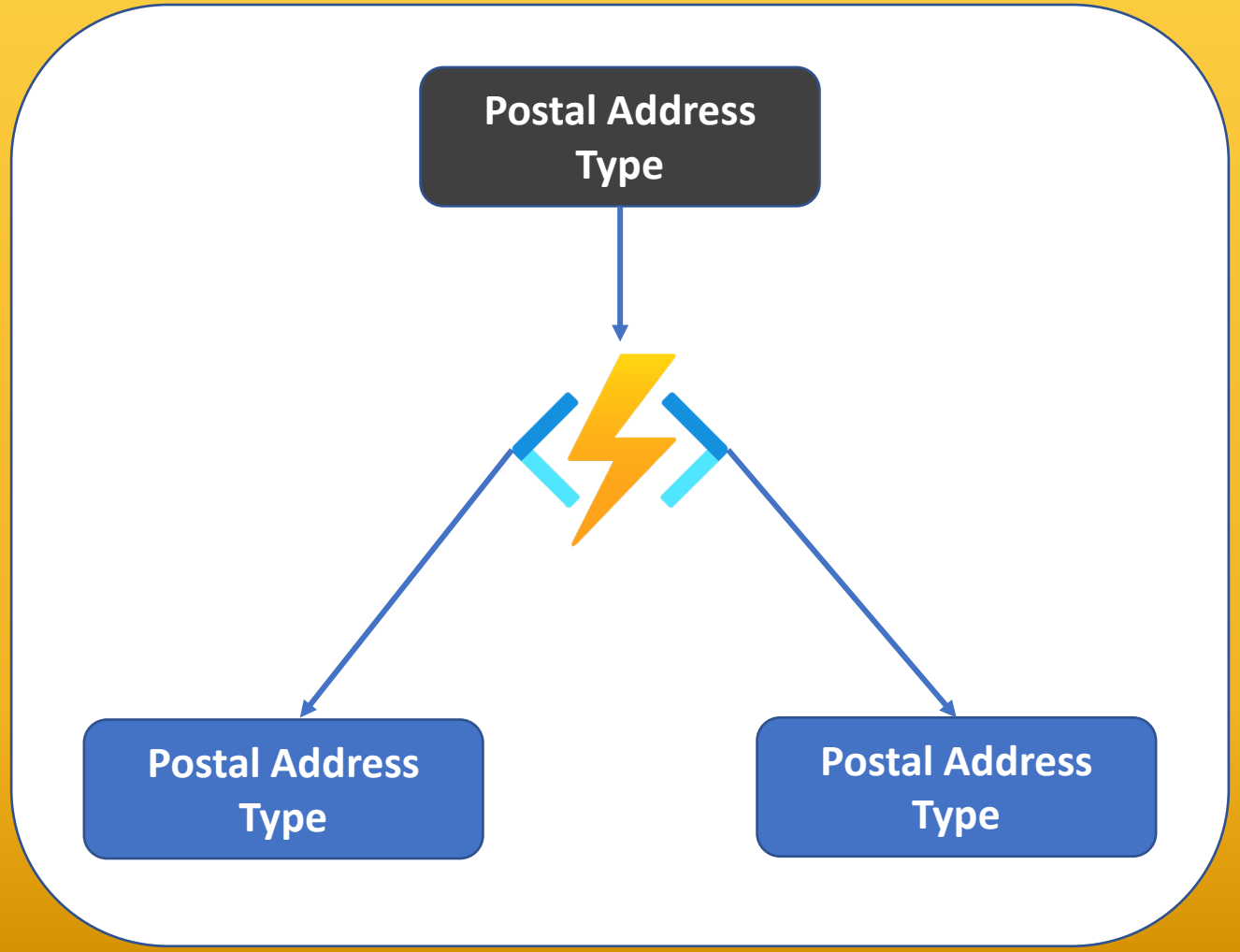
Reference Types

- Country
- Country Division
- Language/Culture
- Phone Number Type
- Postal Address Type
- Property Type
- Room Type
- Attribute Data Type
- Attribute Category

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Reference Types



Best Tool(s) for the Job

Thank You

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