OutSystems

OutSystems
Database Entities

Topics

- Data Modeling in OutSystems

- Entities
  - Entity Attributes
  - Basic Data Types
  - Entity Actions

- Static Entities
  - Static Entity Records
  - Using Static Entities

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Data Modeling in OutSystems

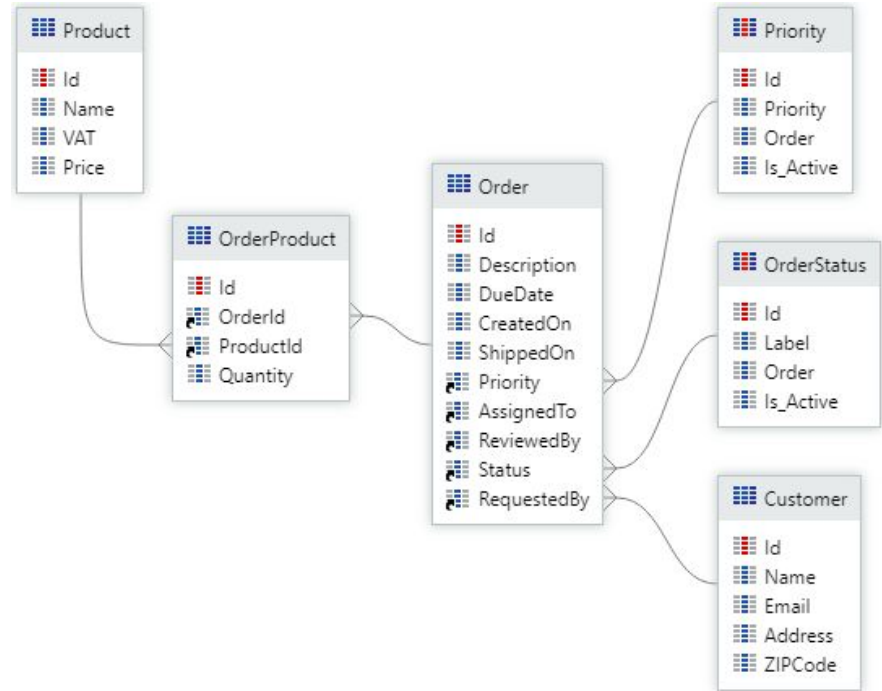Many applications work with data that needs to be persisted in the Database
- Compound data with multiple fields

OutSystems enables persisting data with:
- Entities
- Static Entities

Entities and Static Entities are created in Service Studio
- OutSystems manages the creation of the underlying Database tables
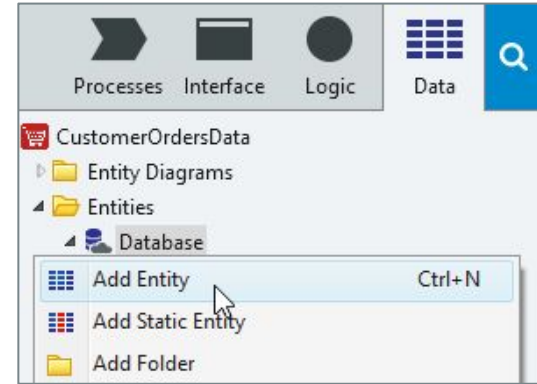
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Entities

An Entity is persisted in a **Database Table**
- Each new instance or record of an Entity is **inserted as a row** on the corresponding table

A different Entity should be created for each application concept
- Customer, Order and Order Item

An Entity is defined by fields called **Attributes**
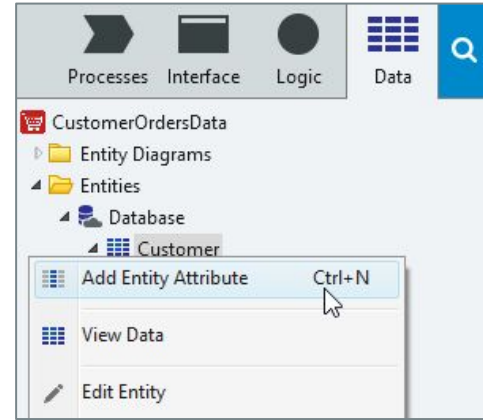
Entity Attributes

Entity data is stored in its **attributes**

Each Attribute
- Is **a Column** on the respective database Table
- Must be one of the Basic Types

Every Entity is created with a special Id Attribute
- **Primary key** in the database
- Supports relational database operations

Basic Data Types

Family	OutSystems Data Type	Example	Default Value
Alphanumeric	**Text**	"OutSystems"	""
	Phone Number	"+1 555 111 222"	""
	Email	"support@mail.com"	""
Numeric	**Integer**	42	0
	Long Integer	4200000000	0
	Decimal	11.08	0.0
	Currency	9.99	0.0
Logic	**Boolean**	True	False
Dates and Times	**Date Time**	#2011-12-13 14:15:16#	#1900-01-01 00:00:00#
	Date	#2011-12-13#	#1900-01-01#
	Time	#14:15:16#	#00:00:00#
Large Object	**Binary Data**	<Unprintable>	<0 bytes>
Referential	**Entity Identifier**	<Positive Integer or Text>	NullIdentifier()

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Data Type Inference

When naming a new attribute (or variable), OutSystems tries to infer its type

- Integer   ← x, y, z, *Count, *Number

- Date   ← *Date
  e.g. BirthDate

- DateTime   ← *DateTime, *On, *Instant
  e.g. Datetime, CreatedOn

- Time   ← *Time

- Boolean   ← Is*, Has*
  e.g. IsCompleted, HasDocument

- Email   ← *Email

- PhoneNumber   ← *Phone, *Mobile
  e.g. HomePhone, WorkMobile

- Currency   ← *Amount, *Price

- User Identifier   ← *By
  e.g. CreatedBy

- Entity Identifier   ← *<Entity>*Id
  e.g. CustomerId

- Entity Record   ← *<Entity>*

- Entity Record List   ← *<Entity>*s/ies

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Entity Actions

OutSystems automatically creates **Entity Actions** for each of the CRUD data operations

Data operations refer to the Entity by its Name:

- **C**reate: CreateCustomer
- **R**etrieve: GetCustomer
- **U**pdate: UpdateCustomer
- **D**elete: DeleteCustomer

Entity Actions can be used directly in the application logic

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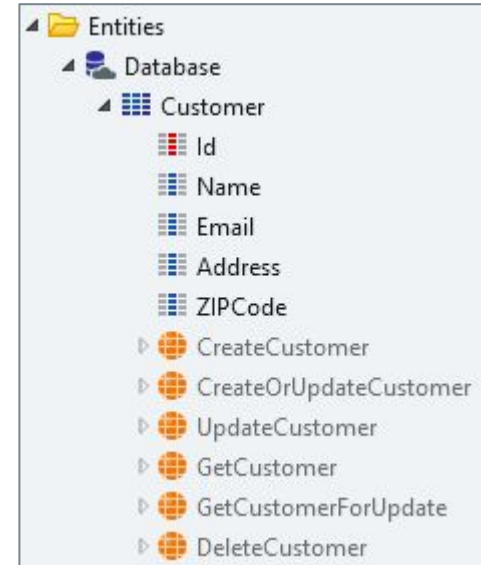
Entity Actions in Detail

Entity Action	Parameters	Description
🟠**Create<*EntityName*>**	➡️🗂️Source: Entity record ⬅️🗂️Id: Entity Id	Inserts a new record in the database, returning the Id of the newly created row
🟠**CreateOrUpdate<*EntityName*>**	➡️🗂️Source: Entity record ⬅️🗂️Id: Entity Id	Inserts in the database (or updates if it exists) the record, returning the appropriate row Id
🟠**Update<*EntityName*>**	➡️🗂️Source: Entity record	Updates the record in the database. If it doesn't exist, an error occurs
🟠**Get<*EntityName*>**	➡️🗂️Id: Entity Id ⬅️🗂️Record: Entity record	Retrieves from the database the record with the provided Id. If it doesn't exist, an error occurs
🟠**GetForUpdate<*EntityName*>**	➡️🗂️Id: Entity Id ⬅️🗂️Record: Entity record	Similar to the Get entity action. Database row is locked until the database transaction finishes
🟠**Delete<*EntityName*>**	➡️🗂️Id: Entity Id in database	Deletes from the database the record with the provided Id. If it doesn't exist, an error occurs

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Static Entities

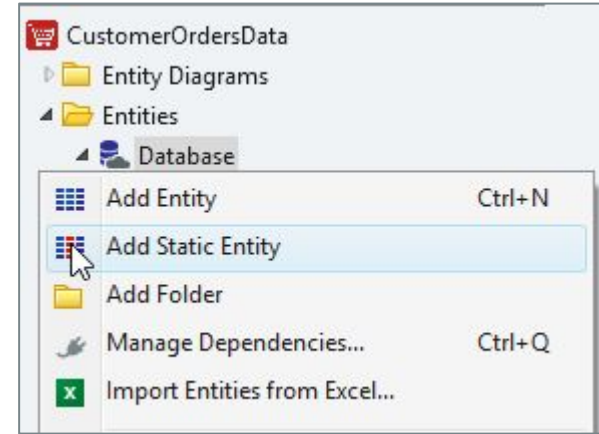Static Entities are Entities that have a predefined set of possible values
- Attribute values are defined at design time

Each value of a Static Entity is a **Record**

Static Entity records **can NOT be created, updated, or deleted**; only retrieved
- **Get<StaticEntityName>** is the only Entity Action

Static Entities can be used like enumerations

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Static Entity Records

- Static Entities Records start with
  4 automatically created attributes
  - Id
  - Label
  - Order
  - Is Active

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Static Entity Records

- Static Entities Records start with 4 automatically created attributes
  - Id
  - Label
  - Order
  - Is Active

- These attributes can be changed or deleted and others can be added

- Define each Record by setting the value of each Attribute
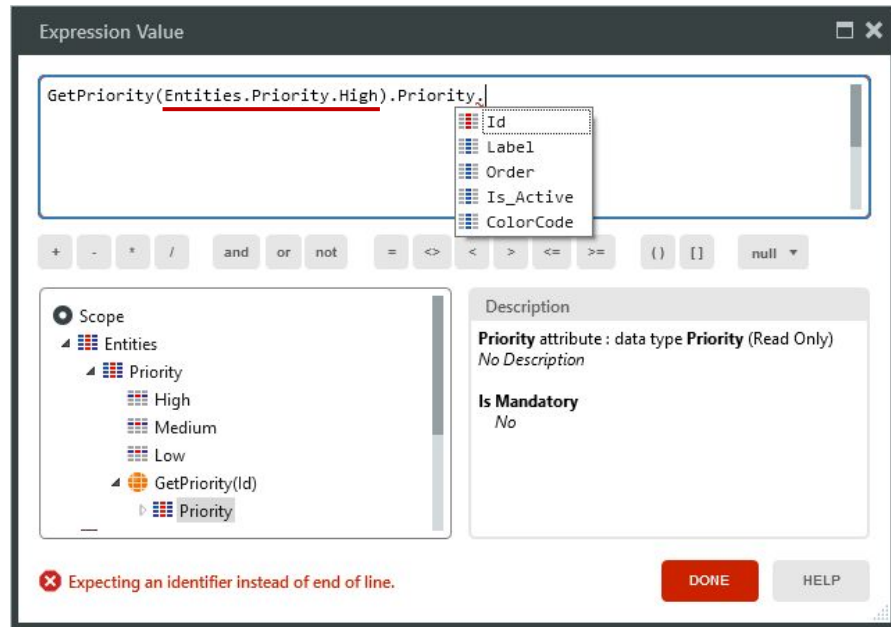 - In Service Studio (development time)

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Using Static Entities

Static Entity Records can be
referenced by Record name

- Known at design time

Record name can be used in place of the
Static Entity's Identifier

- In an Input of an action or a function
  (e.g. GetPriority Entity Action)
- Directly in an Expression or Assign

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Summary

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  - Entity Attributes
  - Basic Data Types
  - Entity Actions

- Static Entities
  - Static Entity Records
  - Using Static Entities

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Thank You!