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

Data Modeling in OutSystems

Many applications work with data that needs to be persisted in the Database

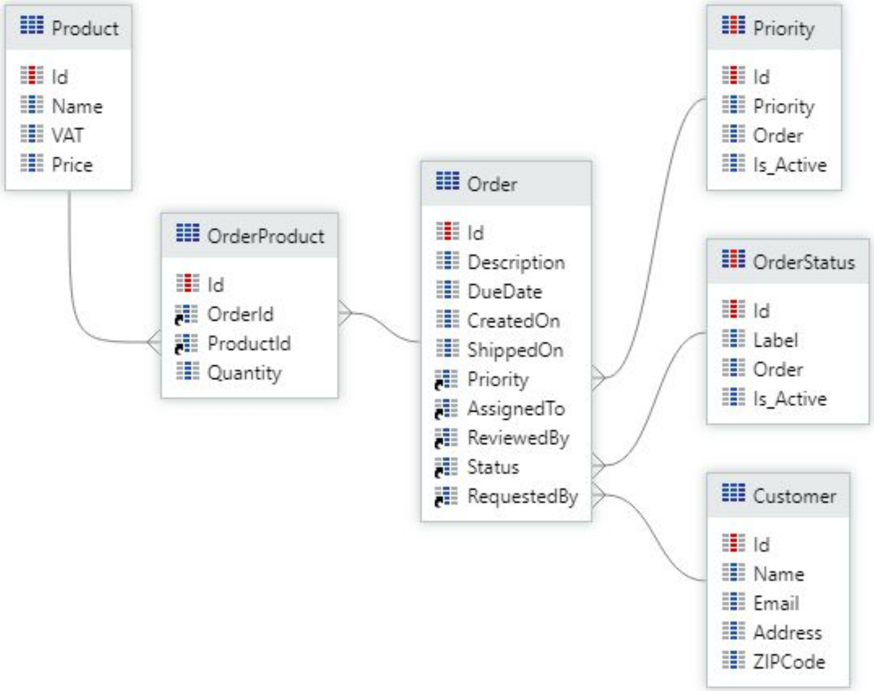
- Compound data with multiple fields

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



Product
- Id
- Name
- VAT
- Price

OrderProduct
- Id
- OrderId
- ProductId
- Quantity

Order
- Id
- Description
- DueDate
- CreatedOn
- ShippedOn
- Priority
- AssignedTo
- ReviewedBy
- Status
- RequestedBy

Priority
- Id
- Priority
- Order
- Is_Active

OrderStatus
- Id
- Label
- Order
- Is_Active

Customer
- Id
- Name
- Email
- Address
- ZIPCode

Entities

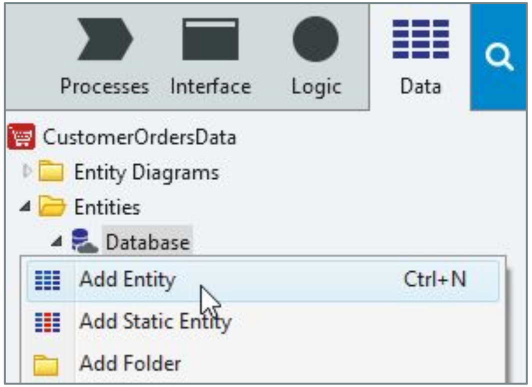
An Entity is persisted in a **Database Table**

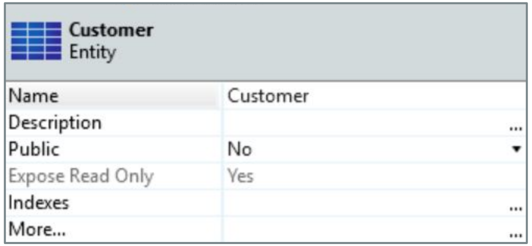
- Each new instance or record of an Entity is **inserted as a row** on the corresponding table

A different Entity should be created for each application concept

- Customer, Order and Order Item

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





Customer
Entity

Name	Customer
Description	...
Public	No
Expose Read Only	Yes
Indexes	...
More...	...

Entity Attributes

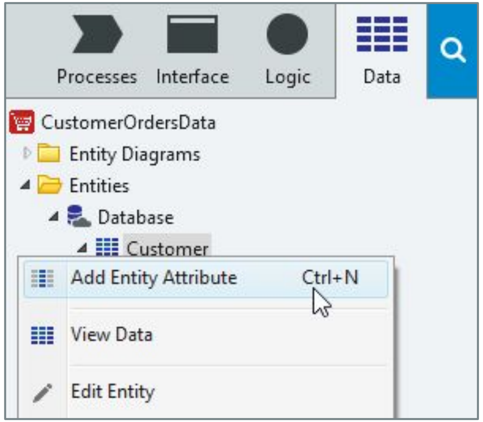
Entity data is stored in its **attributes**

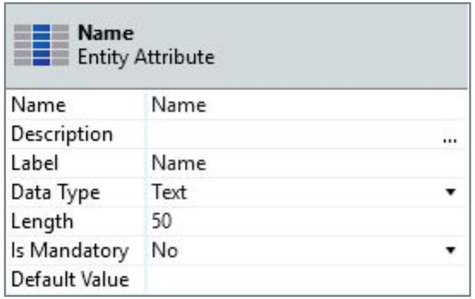
Each Attribute

- 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




Name
Entity Attribute

Name	Name
Description	...
Label	Name
Data Type	Text ▾
Length	50
Is Mandatory	No ▾
Default Value	

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()

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

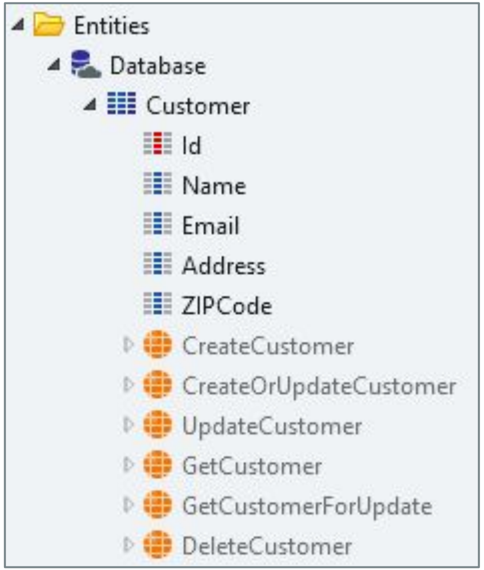
Entity Actions

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



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

Static Entities

Static Entities are Entities that have a predefined set of possible values

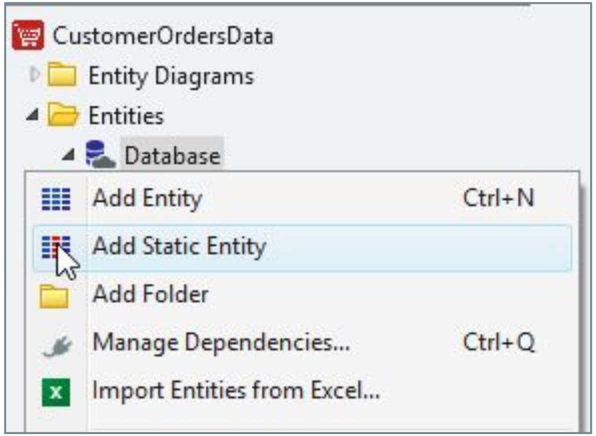
- Attribute values are defined at design time

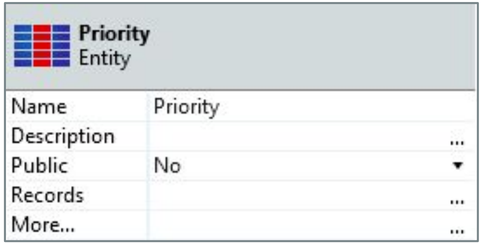
Each value of a Static Entity is a **Record**

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



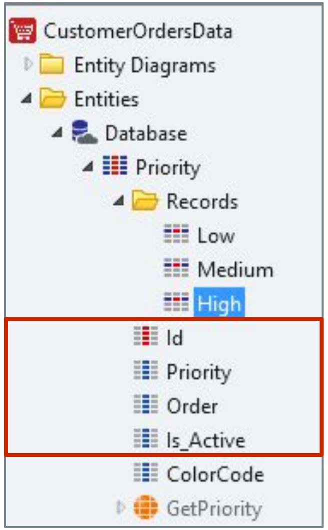


Priority
Entity

Name	Priority
Description	...
Public	No
Records	...
More...	...

Static Entity Records

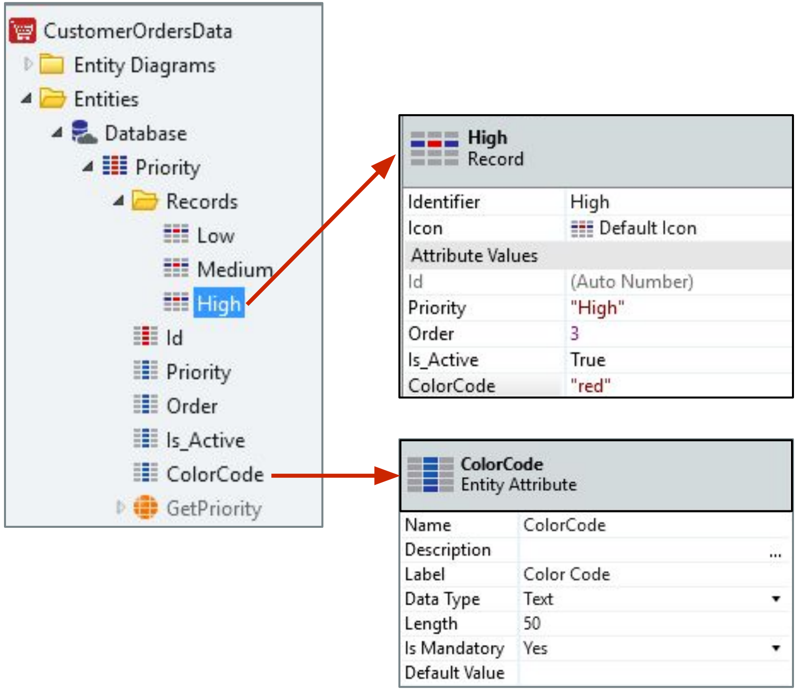
- Static Entities Records start with 4 automatically created attributes
  - Id
  - Label
  - Order
  - Is Active



CustomerOrdersData
Entity Diagrams
Entities
Database
Priority
Records
Low
Medium
High
Id
Priority
Order
Is_Active
ColorCode
GetPriority

Static Entity Records

- Static Entities are created 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)



High
Record

Identifier	High
Icon	Default Icon
Attribute Values	
Id	(Auto Number)
Priority	"High"
Order	3
Is_Active	True
ColorCode	"red"

ColorCode
Entity Attribute

Name	ColorCode
Description	...
Label	Color Code
Data Type	Text
Length	50
Is Mandatory	Yes
Default Value	

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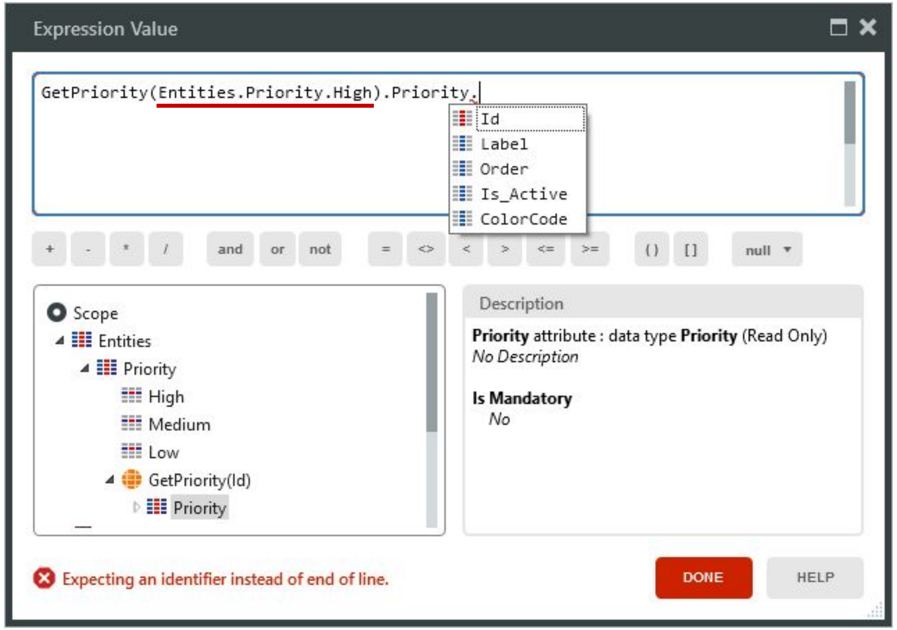
Using Static Entities

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



```
GetPriority(Entities.Priority.High).Priority.
```

Priority attribute : data type **Priority** (Read Only)
No Description

Is Mandatory
No

Expecting an identifier instead of end of line.

Summary

- Data Modeling in OutSystems
- Entities
  - Entity Attributes
  - Basic Data Types
  - Entity Actions
- Static Entities
  - Static Entity Records
  - Using Static Entities

OutSystems

Database Entities

Thank You!