



Introduction to Survivorship strategies, rules and Operational Value (ov) calculation

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- ❑ This session opens a series of Webinars to deep dive the topic of Entity Resolution and Survivorship rules
- ❑ The goal of this session is to
 - ❑ Outline the bedrock of Entity Resolution - OV, Survivorship Rules and Strategies
 - ❑ Set a basis for the next webinar where we will start to dive deeper into the data model techniques and advanced survivorship strategies including fallback strategies that allows to model complex business solutions

Agenda

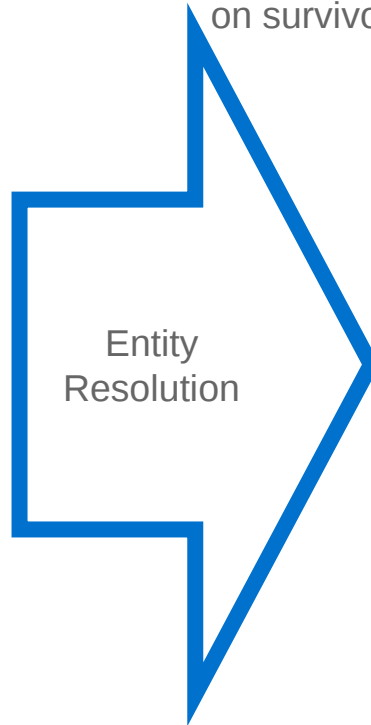
- ★ Introduction and goals of this webinar
- ★ Reltio MDM Entity Resolution
- ★ Operational Values (OV)
- ★ OV in User Interfaces
- ★ OV in data structures, data cleanse and profile matching
- ★ OV calculator
- ★ Survivorship rules and groups
- ★ Structure of the survivorship group
- ★ Survivorship strategies - structure
- ★ Survivorship strategies - types
- ★ Walk-through Survivorship strategies
 - LUD(Last Update Date)
 - SRC_SYS
 - Frequency
 - Aggregation
 - OldestValue
 - MinValue/MaxValue
 - WinnerEntityCrosswalk
 - OtherAttributeWinnerCrosswalk

Entity Resolution

Entity Resolution happens on the attribute level where each attribute value loses or wins (survive). Survived value is called operational value OV, it is calculated by OV calculator based on survivorship rules set for each attribute type.

Crosswalk A	
Attribute	Value
First Name	Michael
Last Name	Frasca

Crosswalk B	
Attribute	Value
First name	Mike
Last Name	F.



Resolved Object		
Attribute	Operational Value	Non Operational Value
First Name	Mike	Michael
Last Name	Frasca	F.

Operational Values (OV)

OV (or “operational value”) is a boolean property of the attribute that defines the state of the resolved business object on the level of each individual attribute of that object.

OV is a mandatory property of the attribute, its value can only be true or false.

It is set for all types of attributes - Simple, Nested, Sub-nested, Reference and Sub-reference.

Each attribute can have 0, 1, or multiple values that are marked as operational.

Sample attribute structure. The first value is operational:

```
"FirstName": [  
  {  
    "type": "configuration/entityTypes/HCP/attributes/FirstName",  
    "ov": true,  
    "value": "Simon",  
    "uri": "entities/3pJiMCX/attributes/FirstName/N801VbpB"  
  },  
  {  
    "type": "configuration/entityTypes/HCP/attributes/FirstName",  
    "ov": false,  
    "value": "SIMON",  
    "uri": "entities/3pJiMCX/attributes/FirstName/LzNnWJgh"  
  },  
  {  
    "type": "configuration/entityTypes/HCP/attributes/FirstName",  
    "ov": false,  
    "value": "simon",  
    "uri": "entities/3pJiMCX/attributes/FirstName/LzNnWwX"  
  }  
],
```

OV in User Interfaces

Simon Mitchell

414 36th St Oakland

HCP

Entity ID: 3pJiMCX

- Profile View contains only operational values
- Source View contains survived and loser values in association with crosswalks (sources)

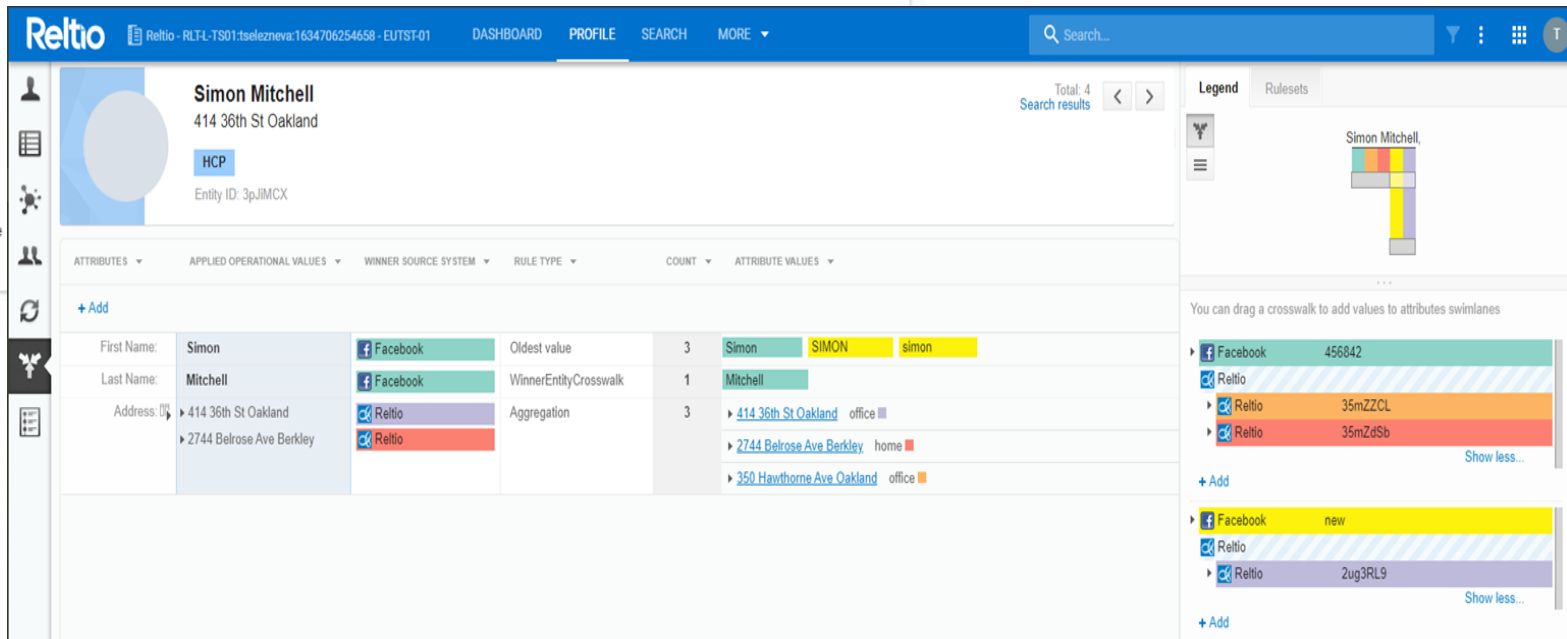
Attributes View

First Name  Simon

Last Name Mitchell

Address 

- ▶ 414 36th St Oakland office
- ▶ 2744 Belrose Ave Berkley home



Reltio Reltio - RLFL-TS01:1selezneva:1634706254658 - EUTST-01 DASHBOARD PROFILE SEARCH MORE

Search...

Total: 4 Search results

Simon Mitchell
414 36th St Oakland
HCP
Entity ID: 3pJiMCX

ATTRIBUTES	APPLIED OPERATIONAL VALUES	WINNER SOURCE SYSTEM	RULE TYPE	COUNT	ATTRIBUTE VALUES
First Name:	Simon	Facebook	Oldest value	3	Simon SIMON simon
Last Name:	Mitchell	Facebook	WinnerEntityCrosswalk	1	Mitchell
Address:	414 36th St Oakland 2744 Belrose Ave Berkley	Reltio	Aggregation	3	414 36th St Oakland office 2744 Belrose Ave Berkley home 350 Hawthorne Ave Oakland office

+ Add

Simon Mitchell

You can drag a crosswalk to add values to attributes swimlanes

- Facebook 456842
- Reltio 35mZZCL
- Reltio 35mZdSb

+ Add

- Facebook new
- Reltio 2ug3RL9

+ Add

OV in data structures

OV and non-OV values of the attribute associated with crosswalks via attribute uri



Example: OV value defines
“golden record”:

```

"Address": [
  {
    "label": "414 36th St Oakland",
    "relationshipLabel": "office",
    "value": { ...
  },
  "ov": true,
  "uri": "entities/3pjiMCX/attributes/Address/2ug3RL9",
  "refEntity": { ...
  },
  "refRelation": { ...
  },
  "startObjectCrosswalks": [ ...
  ],
  "endObjectCrosswalks": [ ...
  ]
},
{
  "label": "350 Hawthorne Ave Oakland",
  "relationshipLabel": "office",
  "value": { ...
  },
  "ov": false,
  "uri": "entities/3pjiMCX/attributes/Address/35mZZCL",
  "refEntity": { ...
  },
  "refRelation": { ...
  },
  "startObjectCrosswalks": [ ...
  ],
  "endObjectCrosswalks": [ ...
  ]
},
{
  "label": "2744 Belrose Ave Berkley",
  "relationshipLabel": "home",
  "value": { ...
  },
  "ov": true,
  "uri": "entities/3pjiMCX/attributes/Address/35mZdSb",
  "refEntity": { ...
  },
  "refRelation": { ...
  }
}

```

```

"uri": "entities/19MQ6FGA",
"type": "configuration/entityTypes/HCP",
"createdBy": "tselezneva",
"createdTime": 1642405832485,
"updatedBy": "tselezneva",
"updateTime": 1642405832485,
"attributes": {
  "FirstName": [
    {
      "type": "configuration/entityTypes/HCP/attributes/FirstName",
      "ov": true,
      "value": "Harry",
      "uri": "entities/19MQ6FGA/attributes/FirstName/2rIpAFio2"
    }
  ],
  "LastName": [ ...
  ]
},
"isFavorite": false,
"crosswalks": [
  {
    "uri": "entities/19MQ6FGA/crosswalks/2rIpAFrKY",
    "type": "configuration/sources/FB",
    "value": "hcp",
    "reltioLoadDate": "2022-01-17T07:50:32.485Z",
    "createDate": "2022-01-17T07:50:32.485Z",
    "updateDate": "2022-01-17T07:50:32.485Z",
    "attributes": [
      "entities/19MQ6FGA/attributes/LastName/2rIpAFn4i",
      "entities/19MQ6FGA/attributes/FirstName/2rIpAFio2"
    ],
    "singleAttributeUpdateDates": {}
  },
  {
    "uri": "entities/19MQ6FGA/crosswalks/2rIpAG47K",
    "type": "configuration/sources/HMS",
    "value": "hcp2",
    "reltioLoadDate": "2022-01-17T07:50:32.485Z",
    "createDate": "2022-01-17T07:50:32.485Z",
    "updateDate": "2022-01-17T07:50:32.485Z",
    "attributes": [
      "entities/19MQ6FGA/attributes/FirstName/2rIpAFio2"
    ],
    "singleAttributeUpdateDates": {}
  }
]

```

OV calculator

- Operational Value is calculated based on the Survivorship rules, based on Survivorship strategies
- Survivorship rules and Survivorship strategies are two different concepts
- Strategies are parts of the predefined logic that can be used to calculate ov.
- Rules describe which strategy from the specified ones will be applied to the attribute and whether extended settings for ov calculation are applied
- **Operational Value is not stored and is calculated on the fly every time an operation is applied to an entity. Every time survivorship rule is changed, ReindexTask and RebuildMatchTable tasks are required**

Survivorship Rule

```
"mapping": [{
  {
    "attribute": "configuration/entityTypes/HCP/attributes/FirstName",
    "fallbackStrategies": [{
      {
        "attribute": "configuration/entityTypes/HCP/attributes/FirstName",
        "survivorshipStrategy": "SRC_SYS"
      }
    ],
    "fallbackUsingCriteria": "ZERO_OR_MORE_THAN_ONE",
    "survivorshipStrategy": "LUD"
  }
},
```

Other calculation rules

- Pinned values are always OV and rules are not applied to them
- Ignored values and end-dated crosswalks are not participating in OV calculation

Survivorship strategy

```
"survivorshipStrategies": [{
  {
    "uri": "configuration/survivorshipStrategies/LUD",
    "label": "Recency"
  }
},
```

OV operations

Sample configuration of the address cleanse operation that will be applied only to operational values of the address:

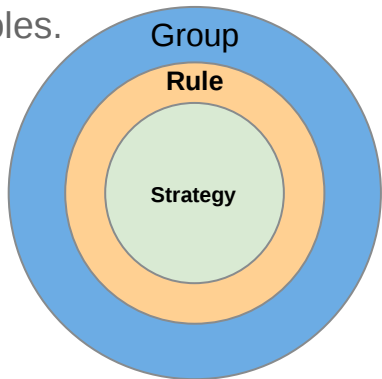
```
"cleanse":[
  {
    "cleanseFunction":"Loqate",
    "options":{
      "loqateKey":"2ebdcf4ae28ff15",
      "loqateDefaultCountry":"US",
      "returnUnverifiedStatus":true,
      "process":"v+g",
      "ovOnly":true,
      "opts":{
        "PreferPrimaryValidAlias":"Yes"
      }
    }
  }
]
```

Other operations:

- OV-only search
- OV-only export
- OV-only matching
 - matchOvOnly parameter
- OV-only Bulk Update (New in 22.1)

Survivorship rules and groups

Survivorship rules are specified in a business configuration in a section “survivorshipGroups” for each **entity and relation type**. All the survivorship rules, which are called “mappings” in a configuration, are wrapped into “survivorship group”. Groups allow applying different rules for users with different roles.



Sample Group

```
"survivorshipGroups": [ ← Group
  {
    "uri":
    "configuration/entityTypes/HCP/survivorshipGroups/default",
    "default": true,
    "mapping": [ ← Rule
      {
        "attribute":
        "configuration/entityTypes/HCP/attributes/FirstName",
        "survivorshipStrategy": "LUD" ← Strategy
      },
      . . .
    ]
  },
  . . .
]
```

Strategy can be used by multiple rules

Structure of survivorship group

- **Uri** - uri of the group, the last part is a group name
- **“Default” flag**. Non-default groups are used for rulesets (we will consider in the next sessions), i.e. it can be assigned to a specific user role. Default groups are used by all the users who don't have the specified roles.
- **mapping** - the main section that describes which strategy must be applied to which attribute and what to do if we have no winner values or too many of them.

“Mapping” elements:

- **attribute** - a uri of an attribute to apply this mapping to. It can be simple, nested, sub-nested and reference attribute, existing in this entity/relation type. It is prohibited to set a mapping for sub-reference attributes - it must be set in a referenced entity instead.
- We cannot have a mapping for the same attribute inside one group, otherwise we'll get a validation error.
- **survivorship strategy** - a name of the strategy from “survivorshipStrategies”

```
"survivorshipGroups": [  
  {  
    "uri": "configuration/entityTypes/HCP/survivorshipGroups/default",  
    "default": true,  
    "mapping": [  
      {  
        "attribute": "configuration/entityTypes/HCP/attributes/FirstName",  
        "survivorshipStrategy": "LUD"  
      },  
      ...  
    ],  
  },  
  ...  
],  
"survivorshipStrategies": [  
  {  
    "uri": "configuration/survivorshipStrategies/LUD",  
    "label": "Recency"  
  },  
  ...  
]
```

We can have any number of survivorship groups, but 1 must be marked as default.

If you specify several groups as default - a validation error will be thrown during the attempt to save configuration.

default

+

default

=

error

Structure of survivorship strategy

- “survivorshipStrategies” section is placed on the same level as “sources”, “entityTypes”, “relationTypes” and other elements in a business configuration
- It covers the following functions:
 - Defines which strategies can be used on particular tenant
 - Defines strategies labels that are used in UI
- Each item in the configuration can contain the following fields:
 - **Uri** (obligatory) - a survivorship strategy identified. A name of a strategy = the last part of it. This is what we use in survivorship rules.
 - **Label** (obligatory) - a name of a strategy for UI

```
"survivorshipStrategies": [  
  {  
    "uri": "configuration/survivorshipStrategies/LUD",  
    "label": "Recency"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/Frequency",  
    "label": "Frequency"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/Aggregation",  
    "label": "Aggregation"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/SRC_SYS",  
    "label": "Source system"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/OldestValue",  
    "label": "Oldest value"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/MinValue",  
    "label": "Minimum value"  
  },  
  {  
    "uri": "configuration/survivorshipStrategies/MaxValue",  
    "label": "Maximum value"  
  }  
]
```

Basic types of survivorship strategies

Basic Strategies

- LUD
- SRC_SYS
- Frequency
- Aggregation
- OldestValue
- MinValue
- MaxValue
- OtherAttributeWinnerCrosswalk
- WinnerEntityCrosswalk

ATTRIBUTES	APPLIED OPERATIONAL VALUES	WINNER SOURCE SYSTEM	RULE TYPE	COUNT	ATTRIBUTE VALUES
+ Add					
First Name:	Thomas	Facebook	Recency	1	Thomas
✓ Recency Reltio Cleanser or Nothing Recency Frequency Aggregation Source system Oldest value Minimum value Maximum value Other Attribute Winner Crosswalk WinnerEntityCrosswalk					

LUD - Last Update Date

“Make all values with the most recent update date to be winners for this attribute”

Configuration

```
"mapping": [  
  {  
    "attribute":  
      "configuration/entityTypes/HCP/attributes/First  
      Name",  
    "survivorshipStrategy": "LUD"  
  },  
]
```

Crosswalk A

Update Date: 1/1/2022
First Name: Mike

OV
calculation

Crosswalk B

Update Date: 12/12/2021
First Name: Michael

First Name Attribute Operational Value : Mike

SRC_SYS

“Make values, belonging to a source with the highest priority to be winners”

Configuration

```
"mapping": [  
  {  
    "attribute":  
      "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "SRC_SYS",  
    "sourcesUriOrder": [  
      "configuration/sources/FB",  
      "configuration/sources/TWITTER"  
    ]  
  }  
]
```

Crosswalk A

Type: FB
First Name: Mike

Crosswalk B

Type: TWITTER
First Name: Mike_123

OV
calculation

First Name Attribute Operational Value : Mike

Frequency

“Make values that came from the most number of different sources to be winners”

Configuration

```
"mapping": [  
  {  
    "attribute":  
      "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "Frequency"  
  }  
]
```

Crosswalk A
First Name: Ann

Crosswalk B
First Name: Anna

Crosswalk C
First Name: Anna

OV
calculation

First Name Attribute Operational Value : Anna

Aggregation

"Make all values to be winners"

Configuration

```
"mapping": [  
  {  
    "attribute":  
      "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "Aggregation"  
  },  
]
```

Crosswalk A
First Name: Ann

Crosswalk B
First Name: Anna

OV
calculation

Crosswalk C
First Name: A.

First Name Attribute Operational Value : A., Ann, Anna

Oldest Value

“Make values that came first to be winners”

Configuration

```
"mapping": [  
  {  
    "attribute": "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "OldestValue"  
  },  
]
```

Crosswalk A

Create Date: 1/1/2022
First Name: Mike

OV
calculation

Crosswalk B

Create Date: 12/12/2021
First Name: Michael

First Name Attribute Operational Value : Michael

MinValue/MaxValue

“Make min/max values to be winners”

Configuration

```
"mapping": [  
  {  
    "attribute": "configuration/entityTypes/HCP/attributes/LicenseID",  
    "survivorshipStrategy": "MinValue"  
  },  
]
```

Crosswalk A
LicenseID: 1000

Crosswalk B
LicenseID: 3015

OV
calculation

LicenseID Attribute Operational Value : 1000

Other Attribute Winner Crosswalk

“Make attributes from the source that wins in the other attribute to be winners for this attribute”

Configuration

```
"mapping": [  
  {  
    "attribute": "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "OtherAttributeWinnerCrosswalk",  
    "primaryAttributeUri":  
      "configuration/entityTypes/HCP/attributes/LastName"  
  },  
  {  
    "attribute": "configuration/entityTypes/HCP/attributes/LastName",  
    "survivorshipStrategy": "LUD"  
  },  
],
```

Crosswalk A

Update Date: 1/1/2022
FirstName: Mike
LastName: F

Crosswalk B

Update Date: 12/12/2021
FirstName: Michael
LastName: F_123

OV
calculation

FirstName Attribute Operational Value : Mike

WinnerEntityCrosswalk

"Make all values of the attribute from the winner entity to be winners"

Configuration

```
"mapping": [  
  {  
    "attribute":  
    "configuration/entityTypes/HCP/attributes/FirstName",  
    "survivorshipStrategy": "WinnerEntityCrosswalk"  
  },  
]
```

Entity1
FirstName:
Mike

MERGE



Entity2
FirstName:
Michael



Entity1 wins

OV
calculation

FirstName Attribute Operational Value : Mike