



2022 ESRI USER CONFERENCE

Ensuring Data Quality with Attribute Rules and Contingent Values


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Data Quality

A circular icon with a blue background. It features a white ribbon award with a checkmark inside a circle at the top. The text "Data Quality" is written in white above the icon.

Contingent Values

A circular icon with a teal background. It features a white hierarchical tree structure with several levels of nodes. The text "Contingent Values" is written in white above the icon.


Attribute Rules

A circular icon with an orange background. It features a white icon of a hand holding a wrench. The text "Attribute Rules" is written in white above the icon.

Demo

A circular icon with a red background. It features a white icon of a video player with a play button in the center. The text "Demo" is written in white above the icon.

Materials

A circular icon with a blue background. It features a white icon of a stack of papers or documents. The text "Materials" is written in white above the icon.

Questions

A circular icon with a dark teal background. It features a white icon of three speech bubbles. The text "Questions" is written in white above the icon.

An abstract graphic featuring a stylized globe in shades of green and blue, partially obscured by several thick, overlapping, curved bands in various shades of purple and blue. To the right, a vertical gradient bar transitions from orange at the top to purple at the bottom, with a pattern of small, semi-transparent squares scattered across it.

Data Quality Matters

Data Quality Matters



The background features a dark blue gradient. On the right side, there is a stylized globe with green and blue landmasses. Overlaid on the globe are several thick, curved, overlapping bands in shades of purple, blue, and white. To the right of the globe, there is a vertical gradient from orange at the top to purple at the bottom, with a pattern of small, semi-transparent yellow squares scattered across it.

Contingent Values

Attribute Domains Limitations

Domains can get large

Domains are not related to each other

Need to a way to make domains contingent on each other

Solution? - Meet Contingent Values

Contingent Values



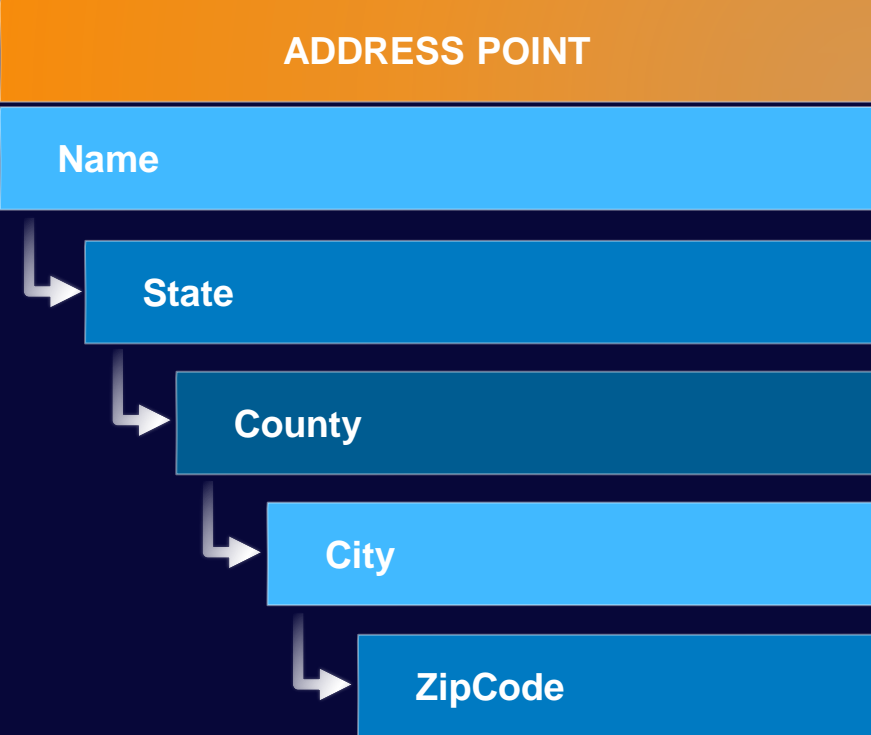
Built in geodatabase functionality

Introduced in ArcGIS Pro 2.3

Data entry:

- Restricts valid attributes for multiple contingent fields

Contingent Values



Create Features

Active Template

! addresspoint

Enter attributes for features you are about to create.

State	<Null>
County	<Null>
City	<Null>
ZipCode	<Null>
Name	<Null>

Contingent Values



Create Features

Active Template

! addresspoint

Enter attributes for features you are about to create.

State	<Null>
County	Field_Group
City	California
ZipCode	Texas
Name	<Show All>

Contingent Values



Create Features

Active Template

! addresspoint

Enter attributes for features you are about to create.

State	California
County	<Null>
City	Field_Group
ZipCode	Orange County
Name	Riverside County
	San Bernardino County
	<Partial Matches>
	<Show All>

Create Features

! addresspoint

Enter attributes for features you are about to create.

State	<Null>
County	Field_Group
City	California
ZipCode	Texas
Name	

Contingent Values



Three overlapping screenshots of the 'Create Features' dialog box in ArcGIS, illustrating contingent values for the 'City' field based on the 'State' and 'County' selections.

The top screenshot shows the 'Active Template' for the 'addresspoint' feature type. The fields are:

State	California
County	San Bernardino County
City	<Null>
ZipCode	Field_Group

The middle screenshot shows the 'City' dropdown menu with a list of cities:

City	<Null>
ZipCode	Field_Group
Name	Chino
	Colton
	Redlands
	Yucaipa
	<Partial Matches>

The bottom screenshot shows the 'City' dropdown menu with a list of cities:

State	<Null>
County	Field_Group
City	California
ZipCode	Texas
Name	<Null>
	Oran
	River
	San
	<Partial

Contingent Values



The image shows a sequence of overlapping screenshots of the 'Create Features' dialog box in ArcGIS. The dialog is titled 'Create Features' and shows an 'Active Template' for a feature type named 'addresspoint'. The dialog prompts the user to 'Enter attributes for features you are about to create.' and displays a table of attributes. The 'ZipCode' field is highlighted, and a list of contingent values is shown below it. The contingent values are: 92373, 92374, 92375, <Partial Matches>, and <Show All>.

Attribute	Value
State	California
County	San Bernardino County
City	Redlands
ZipCode	<Null>
Name	Field_Group

Name
92373
92374
92375
<Partial Matches>
<Show All>

Subtype Level Domains

What about subtype level domains?

Contingent values add an additional layer

Attribute Rules

The background features a stylized globe with green and blue continents on a dark blue background. Overlaid on the globe are several thick, curved, overlapping bands in shades of purple, blue, and pink. To the right of the globe, there is a vertical gradient bar transitioning from orange at the top to purple at the bottom, with a pattern of small, semi-transparent yellow squares scattered across it.

Importance of Automation

Customers have business rules specific for their data

Business rules need to be automated

Custom code is not portable across the platforms (mobile/web/desktop)

Attribute Rules



Built in geodatabase functionality

Introduced in ArcGIS Pro 2.1

Use Arcade to configure rules

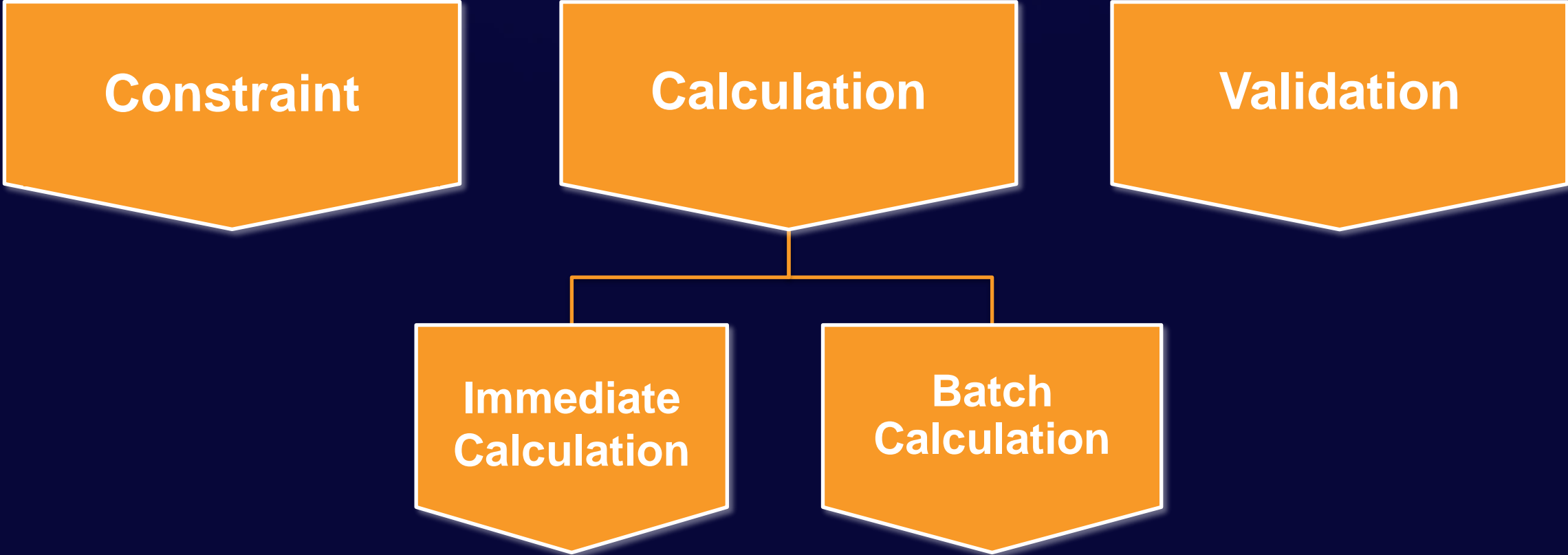
Data entry:

- Populate attributes
- Restrict invalid edits

Data review:

- Generate errors on invalid existing features

Attribute Rules Types



Attribute Rules Types



Constraint

Evaluated during Editing operation

Can configure user defined error message

Edits are rolled back on violation

Enhances editing experience



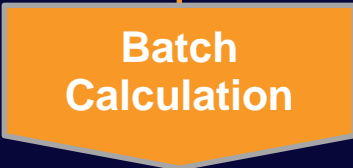
Calculation



Validation

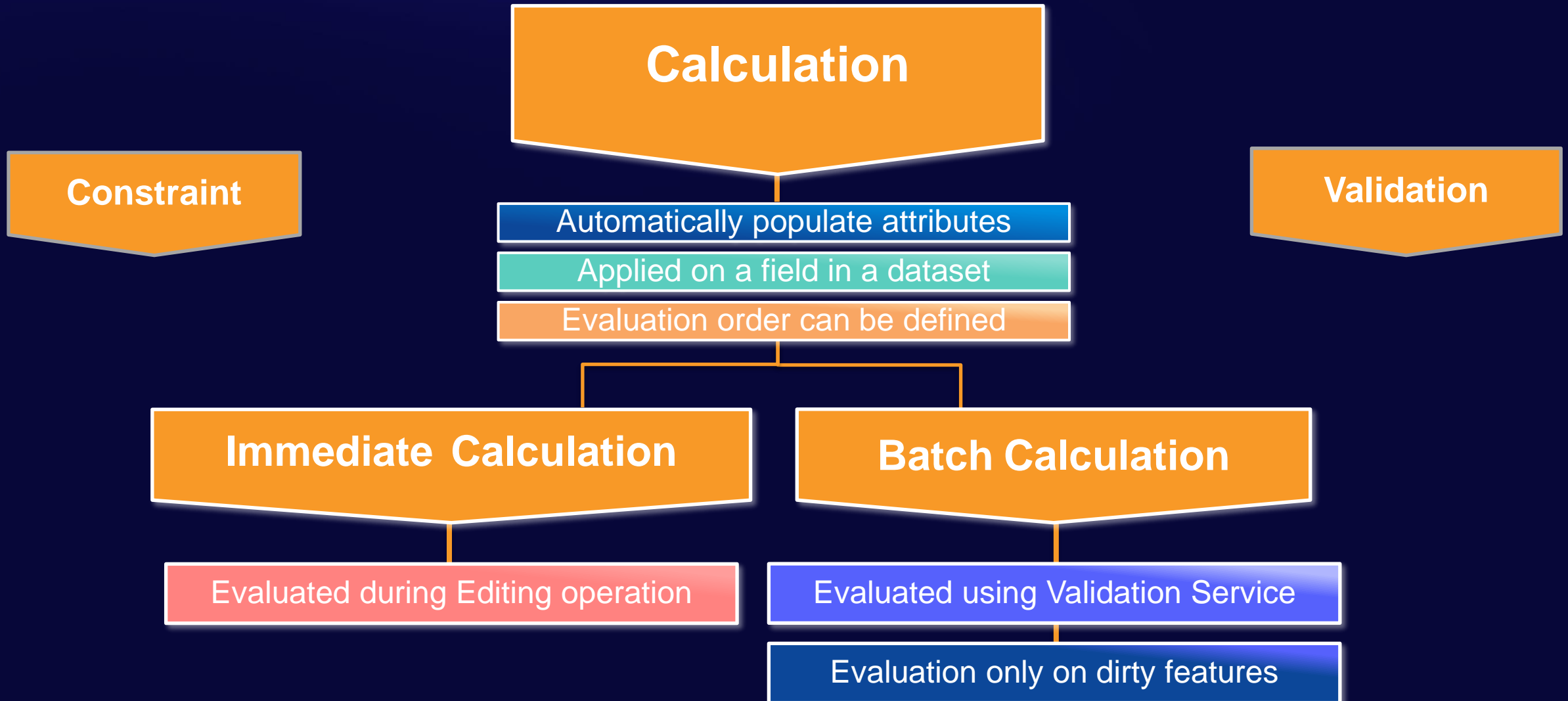


**Immediate
Calculation**

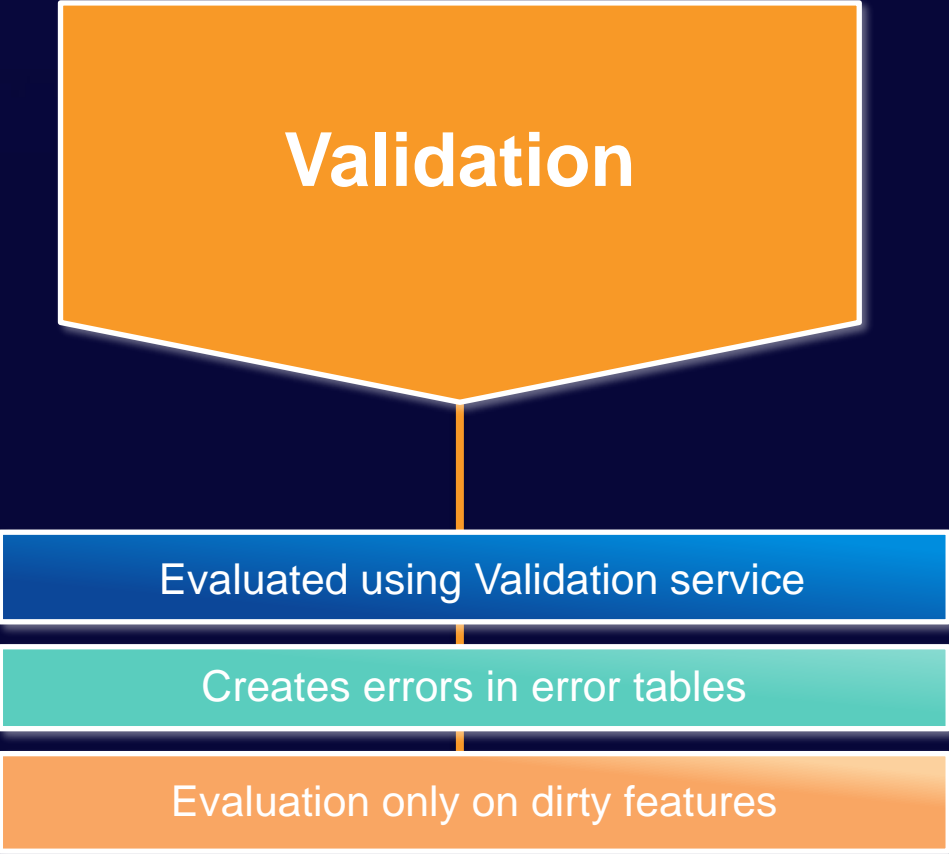
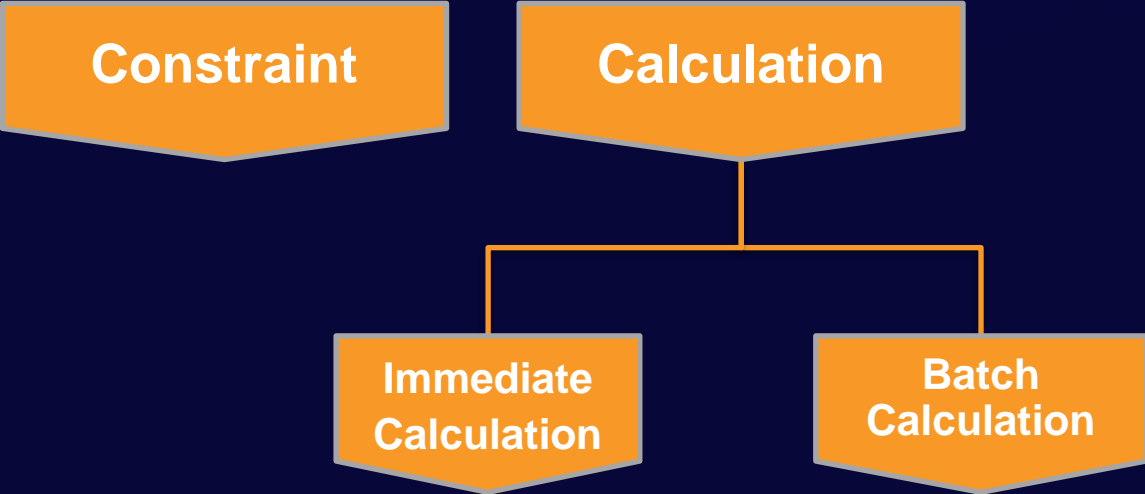


**Batch
Calculation**

Attribute Rules Types



Attribute Rules Types





Supporting Biodiversity in Colombia

Solution for Costa Rica

Problem Statement: Improve data quality to support biodiversity in the context of urban development expansion

Contingent Values

- Helped fill in birds Taxonomic Rank
- During data entry



Validation rule

- Ensured the fields of interest are not null
- During data reviewing



Branch Versioning

- Reconcile & Post to the default version
- During QA/QC processes



Public Facing Web Map

- With bird observations features
- To facilitate data editing



Solution for Colombia

Problem Statement: Improve data quality to support biodiversity by helping National Park apply for funding

Contingent Values

- Help fill in birds Taxonomic Rank



Validation rule

- Ensure the fields of interest are not null



Batch Calculation rules

- Automatically calculate the bird counts within park proximity



Public facing Dashboard

- With bird observations within park proximity

Solution for Costa Rica

Problem Statement: Improve data quality to support biodiversity in the context of urban development expansion

Contingent Values

- Helped fill in birds Taxonomic Rank
- During data entry



Validation rule

- Ensured the fields of interest are not null
- During data reviewing



Branch Versioning

- Reconcile & Post to the default version
- During QA/QC processes



Public Facing Web Map

- Displayed bird observations features
- To facilitate data editing



Solution for Colombia

Problem Statement: Improve data quality to support biodiversity by helping National Park apply for funding

Contingent Values

- Helped fill in birds Taxonomic Rank
- Ensured data accuracy during data entry



Validation rule

- Ensured the fields of interest are not null
- Ensured data completeness during data reviewing



Batch Calculation rules

- Calculated automatically the bird counts within park proximity
- Ensured data relevancy and increased productivity



Public facing Dashboard

- Displayed bird observations within park proximity
- Presented analysis results in an easy-to-read format

Key Takeaways



- ✓ Contingent values and attribute rules ensure data quality by allowing only data that satisfies business rules in.
- ✓ Contingent values and attribute rules are cross platform so customers can ensure data quality across different platforms.
- ✓ Contingent values and attribute rules can adapt to different business rules and workflows.

An abstract graphic design featuring a central globe with a green and blue color scheme, partially obscured by several thick, overlapping, curved ribbons in shades of purple, blue, and pink. To the right, a vertical gradient bar transitions from orange at the top to purple at the bottom, with a pattern of small, semi-transparent squares scattered across it. The background is a dark, deep blue.

Supporting Materials

Supporting Materials



CONTINGENT VALUES

- [Contingent Values **Help Page**](#)
- [Planning for Contingencies – Contingent Values in ArcGIS Pro 2.4 **\(Blog Article\)**](#)
- [Ensuring Data Quality with Attribute Rules and Contingent Values **\(UC2020\)**](#)
- [Assess Urban Tree Health Using Contingent Values **\(Learn Lesson\)**](#)
- [Esri Community – Data Management Page](#)

ATTRIBUTE RULES

- [Attribute Rules **Help Page**](#)
- [Attribute Rules from Scratch **\(Video\)**](#)
- [Create, publish, and work with Batch Calculation Attribute Rules **\(Video\)**](#)
- [Working with Validation Rules **\(Video\)**](#)
- [Data Quality Session 2021 QA **\(Blog Article\)**](#)
- [Data Design in Pro **\(Story Map\)**](#)
- [Validate edits in the utility network with Attribute Rules **\(Learn Lesson\)**](#)
- [Esri Community – Attribute Rules Page](#)

ARCADE

- [Arcade **Help Page**](#)
- [Arcade Version Matrix](#)
- [Getting to know Arcade **\(Video\)**](#)
- [Attribute Rules in Arcade **\(Video\)**](#)
- [Arcade **Playground**](#)
- [Esri Community – Arcade Page](#)

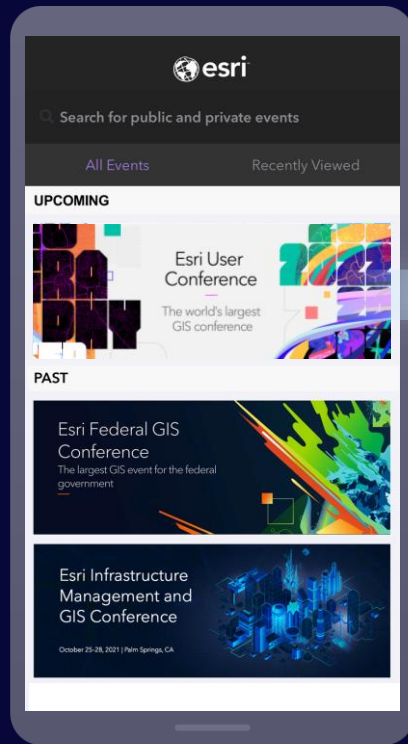
Get Started

Practice

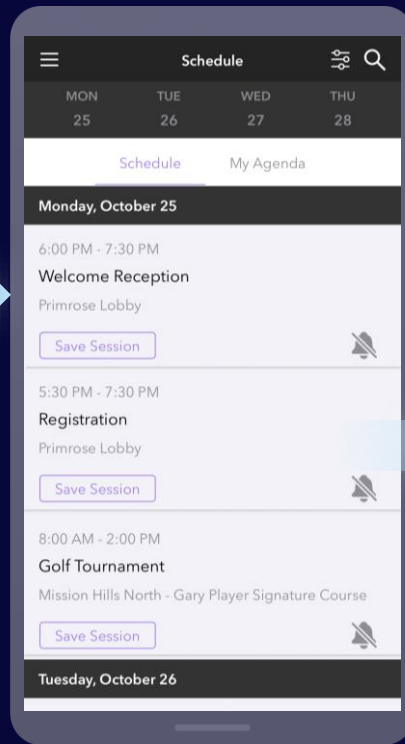
More help?

Please Share Your Feedback in the App

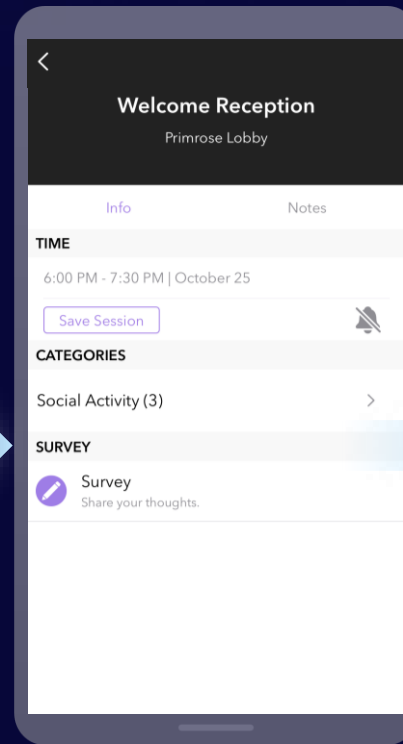
Download the Esri Events app and find your event



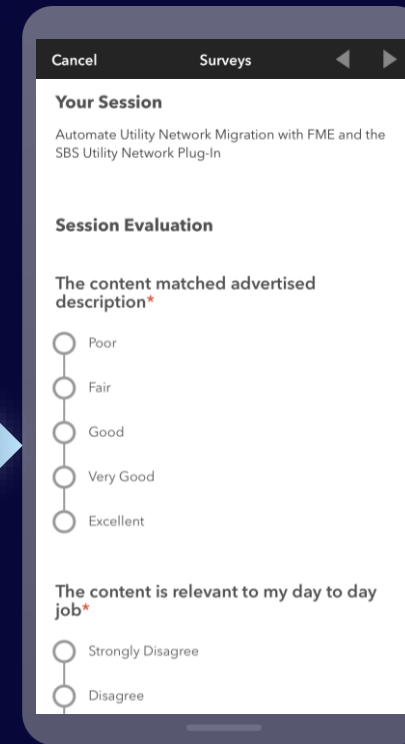
Select the session you attended



Scroll down to "Survey"



Log in to access the survey





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Questions