ArcGIS Data Reviewer: Integrating Data Quality Control into Web Applications

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Agenda

• What is ArcGIS Data Reviewer?
• Automated Review
• Semi-Automated Review
• Analyzing & Reporting Data Quality
• References/Resources
Data quality management
Capabilities of the ArcGIS Platform

Geodatabase integrity
- Schema constraints
- Geoprocessing tools
- Data load checks
- Versioning

Advanced data types
- Topologies
- Utility network
- Parcel fabric

ArcGIS Data Reviewer
- Automated review
- Semi-automated review
- Error management
- Quality reporting
What is ArcGIS Data Reviewer?
Data quality management in the ArcGIS platform

- **Data Reviewer for Desktop**
  - ArcGIS Pro
  - ArcMap

- **Data Reviewer for Server**
  - ArcGIS Server (standard or higher)

- **Data Reviewer API**
  - JavaScript
  - ArcGIS Pro SDK for Microsoft .NET

- **Web AppBuilder for ArcGIS**
Demo Scenario

- Organization needs to improve emergency response time through the use of high quality GIS address data and other automation.

- Success Criteria
  - Streamline data collection processes
  - Required attributes are populated accurately
  - Spatial integrity of data collection is maintained
  - Key features should be positionally accurate
  - All features should be collected
  - All errors are summarized, corrected and verified
Automated Review
Automated Review Methods

Different Type of Issues in GIS Data

- Attribution
- Feature Integrity
- Metadata
- Spatial Relationships
Demo: Automated Review
From requirements to automated review

- Business Needs
- QA Functional Requirements
- Implementation
  - Automated workflow
  - Semi-automated workflow
  - Quality reporting
Demo: Automated Review
From requirements to automated review

Requirements

Business Needs

QA Functional Requirements

Implementation
- Automated workflow
- Semi-automated workflow
- Quality reporting

Contributor Portal

Automated Scheduled Validation

Automated Review
Automated Review
DEMO
Automated Validation Architecture
Validating features after creation

ArcGIS Server

Reviewer Map Service
Scheduler
Validation Service
Reviewer Results
Data Workspace

Data Reviewer
Web API

Execution Details

REST API
Automated Validation - Code

- JS require's for automated validation tasks

- Get session to write results of validation

- Get uploaded data to run validation

JS Application Code: https://github.com/shankarchandru/ContributorPortal
Automated Validation - Code (Contd)

- Configure properties to run validation

- Execute validation and check progress

- Check status and display results

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Demo Scenario - Revisited

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Semi-Automated Review
Value of performing visual review

- Discover Patterns
- Visual Review
- Finding Missing Features
- Compare to Trusted Sources
Semi-Automated Review
Semi-Automated Review - Code

- JS require’s for results tasks

```javascript
// Get Samples for Visual Review
// Set Sample Validation Parameters
var bvParameters = new BatchValidationParameters();
bvParameters.title = "Get Sample to Review";
bvParameters.fileItemId = "ia3897b0b-18f0-4c80-9e00-9bc473838b8d";
bvParameters.sessionString = "Session 5 : Fieldtech1";
bvParameters.productWorkspace = this.serverUploadFolder;
bvParameters.changedFeaturesOnly = false; // Run on entire dataset
bvParameters.createdBy = "Fieldtech1";
var deferred = this bvTask.executeJob(bvParameters);
```

- Get sample for visual review

```javascript
// calls the update lifecycleStatus method from the ReviewerResults task. If selected
updateLifeCycleStatus: function () {
  var reviewerFilters = new ReviewerFilters();
  arrayUtil.forEach(this._rowsSelected, lang.hitch(this, function (selectedItem) {
    reviewerFilters.addAttributeFilter("recordId", selectedItem.recordId);
  }));
  var user = JSON.parse(sessionStorage.getItem("loggedInUser"));
  var sessionID;
  var technicianName;
  if (null != user) {
    sessionID = user.sessions[0];
    technicianName = user.username;
  }
  var deferred = this._reviewerResultsTask.updateLifecycleStatus(parseInt(sessionID),
    Registry.byId("statusSelect").value,
    technicianName, reviewerFilters);
```

- Update lifecycle status of result
Semi-Automated Review  -  Code (Contd)

- JS require’s for write results

```
"esri/tasks/datreviewer/ReviewerLifecycle",
"esri/tasks/datreviewer/ReviewerResultsTask",
"esri/tasks/datreviewer/ReviewerFilters",
'esri/tasks/datreviewer/ReviewerAttributes',
```

- Write missing feature results based on user input attributes

```
var _this = this;
this.reviewTechnician = reviewerAttributes.reviewTechnician;
this.clearGraphics();
var user = JSON.parse(sessionStorage.getItem("loggedInUser"));
if (null != user)
  reviewerAttributes.sessionId = parseInt(user.sessions[0]);
else
  reviewerAttributes.sessionId = parseInt(this.contributorSessionString);
this.map.infoWindow.hide();
this.resultTask.writeResult(reviewerAttributes, this._resultGeometry).then(function(result) {
```

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Report & Analyze Data Quality
Reporting data quality

- What are the issues on a geographic extent?
- How severe are the issues with my data?
- How many types of issues do I have in my data?
- How many issues do I have by source?
- How many issues have been reviewed and fixed?
Reviewer Results

- Spatial and non-spatial information
- Attributes describe check, problem, and validation information
- Identifier provides link back to feature that failed validation
- Have a defined lifecycle (Reviewed, Corrected, Verified)
Report & Analyze Data Quality Demo
Report and Analyze Quality - Code

- JS require's for results tasks

```javascript
"esri/tasks/dataroeverview/ReviewerResultsTask",
"esri/tasks/dataroeverview/DashboardTask",
"esri/tasks/dataroeverview/GetResultsQueryParameters",
"esri/tasks/dataroeverview/ReviewerFilters",
"esri/tasks/dataroeverview/ReviewerLifecycle",

_getDashboardResults: function () {
  var fieldName = this._selectedField;  // Field user has selected and dashboard will agg
  var filters = new ReviewerFilters();  // Create ReviewerFilters object to add attribute
  if(this._selectedSessionId != "" & this._selectedSessionId != "All")
    filters.addAttributeFilter("SESSIONID", parseInt(this._selectedSessionId));
  if(null != this._spatialFilterGeometry &
    (this._selectedSpatialFilterType == "DRAW" ||
    this._selectedSpatialFilterType == "EXTENT")
    filters.addSpatialFilter(this._spatialFilterGeometry);
  var dfdDashboardResults;  // Get Dashboard Results
  if(filters != null & filters.getCount() > 0)
    dfdDashboardResults = this._dashboardTask.getDashboardResults(fieldName, filters)
  else
    dfdDashboardResults = this._dashboardTask.getDashboardResults(fieldName);

dfdDashboardResults.then(lang.hitch(this, function(response) {
  this.RefreshChart(response.dashboardResult);
});
```

- Get dashboard results based on field and filters

JS Application Code : https://github.com/shankarchandru/ContributorPortal
• Get result for a filtered summary based on
  - Page size – number of results in a page
  - Page number – Page of results to see (starting from Index 0)
  - Filters – Applied to summaries

```javascript
if(options.sort) {
    this._queryParameters.sortBy = options.sort[0].attribute;
    this._queryParameters.sortDescending = options.sort[0].descending;
}
var filters = this._getFiltersFromQuery(query);
var pageSize = this._queryParameters.pageSize;
var start = options.start || 0;
if(start != 0 && pageSize - (start % pageSize) <= 10)
    start += pageSize - (start % pageSize);
var pageNumber = ~~(start / pageSize); //~~ rounds result of division to integer
this._queryParameters.pageNumber = pageNumber;
var dfdResults = null;
if(filters.getCount() > 0)
    dfdResults = this._resultsTask.getResults(this._queryParameters, filters);
else
    dfdResults = this._resultsTask.getResults(this._queryParameters);
```

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Want to learn more?

- Documentation
  - Desktop
Want to learn more?

- **Documentation**
  - Desktop
  - Enterprise
Want to learn more?

• Documentation
  - Desktop
  - Enterprise

• Training (training.esri.com)
  - Assessing Data Quality using ArcGIS Data Reviewer (Seminar)  
  - Data QC with ArcGIS: Automating Validation (Web Course)
  - Data QC with ArcGIS: Visual Review (Web Course)
  - Quality Control Using ArcGIS Data Reviewer for Desktop (Instructor-Led)
Want to learn more?

- **Documentation**
  - Desktop
  - Enterprise

- **Training**
  - Assessing Data Quality using ArcGIS Data Reviewer *(Seminar)*
  - Evaluating Positional Accuracy Using ArcGIS Data Reviewer for Desktop *(Seminar)*
  - Data QC with ArcGIS: Automating Validation *(Web Course)*
  - Data QC with ArcGIS: Visual Review *(Web Course)*
  - Quality Control Using ArcGIS Data Reviewer for Desktop *(Instructor Led)*

- **GeoNet** *(geonet.esri.com)*
  - Data Reviewer place
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Questions ?