ArcGIS Data Reviewer: An Introduction

Chandan Banerjee
Jay Cary
Workshop agenda

• Importance of data quality
• What is ArcGIS Data Reviewer?
• Automated review
• Semi-automated review
• Managing errors and data quality reporting
• Summary/resources
Importance of data quality
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance

• Manager
  - Effective data stewardship
  - Drive increased usage
  - Maximize productivity
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance

• Manager
  - Effective data stewardship
  - Drive increased usage
  - Maximize productivity

• Knowledge worker
  - Increased efficiencies
  - Confidence in GIS
Defining quality
A technical perspective

Spatial Accuracy
Thematic Accuracy
Completeness
Logical Consistency
Temporal Quality
Usability

ISO-19157:2013 Geographic information – Data quality
Defining quality

Sources of data quality requirements

Industry standards / specifications
Defining quality
Sources of data quality requirements

- Industry standards / specifications
- Subject matter experts
Defining quality
Sources of data quality requirements

Industry standards / specifications

Subject matter experts

Training and experience
Defining quality
Sources of data quality requirements

- Industry standards / specifications
- Subject matter experts
- Training and experience
- Quality assurance plans
Data quality management
Capabilities of the ArcGIS platform

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

Advanced data types
- Topologies
- Parcel fabric
- Geometric/Utility network

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
Managing quality control
Quality control processes

Semi-automated review

Automated review

Reviewer Results

Quality reporting

ArcGIS Data Reviewer: An Introduction
Demo: Data quality reporting
Workshop scenario

Executive Leadership

Governance

IT Services

Division

Branch

Division

Branch

Business Line Management

Program Analyst

Division

Branch

Division

Branch

Division

Branch
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

- Future data quality requirements are integrated into existing data management workflows
- Key attributes are populated and have the correct values
- All features should be collected within the area of interest
- Features should be accurately positioned
- Data collection processes should be streamlined
- All errors are corrected and verified
Automated review
Managing quality control

Quality control processes

Automated review

Semi-automated review

Quality reporting

Reviewer Results

ArcGIS Data Reviewer: An Introduction
Types of quality control

Automated review

- Fast
- Consistent and repeatable
- Objective
- 100% coverage
Implementing quality requirements
- 40+ configurable checks
- Feature integrity
  - Collection rules
- Attribution
  - Feature and table values
- Spatial
  - Spatial relationships

Automating data validation

http://esriurl.com/12379

ArcGIS Data Reviewer Checks

ArcGIS Data Reviewer: An Introduction
Implementing data quality rules
Rule implementation workflow

Authoring workflow
- Identify and document requirements
- Identify relevant validation methods in ArcGIS
- Implement data quality rules

ArcGIS Data Reviewer Checks
Industry standards / specifications
Subject matter experts
Training and experience
Quality assurance plans
Implementing data quality rules
ArcMap workflow

ArcMap
- Authored using Batch Job Manager
- Rules stored in a Reviewer Batch Job
- Shareable as a file from a network share or via email
- 43 configurable validation methods (v 10.5.1)
Implementing data quality rules
ArcGIS Pro workflow

ArcGIS Pro
- Authored using the Reviewer Rules view
- Rules stored in map
- Shareable as a map or layer file/package and project package/template
- 7 configurable validation methods (v 2.0)
Where to start
Leveraging templates

• Data Reviewer templates
  - Local government
  - Topographic mapping
  - Utilities
    - Electric
    - Gas
    - Water
  - Water resources
• Based on Esri industry models
• Use as starting point
Demo: Authoring data quality rules
Workshop scenario

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Automated review
Methods for executing data validation
Validating features using Reviewer Batch Jobs

Execute data validation using

- ArcMap
Methods for executing data validation
Validating features using Reviewer Batch Jobs

Execute data validation using
- ArcMap
- Geoprocessing
Methods for executing data validation
Validating features using Reviewer Batch Jobs

Execute data validation using
• ArcMap
• Geoprocessing
• ArcGIS Workflow Manager
Methods for executing data validation
Validating features using Reviewer Batch Jobs

Execute data validation using
• ArcMap
• Geoprocessing
• ArcGIS Workflow Manager
• ArcGIS Server

Methods for executing data validation
Validating features using Reviewer Rules

Execute data validation using
• ArcGIS Pro
Demo: Automated review
Workshop scenario

Executive Leadership

Governance

IT Services

Division

Branch

Business Line Management

Division

Branch

Data Technician

ArcGIS Data Reviewer: An Introduction
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
☐ Key attributes are populated and have the correct values
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☐ Features should be accurately positioned
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☐ All errors are corrected and verified
Semi-automated review
Managing quality control
Quality control processes

- **Automated review**
- **Semi-automated review**
- **Quality reporting**

ArcGIS Data Reviewer: An Introduction
Types of quality control

**Automated review**
- Fast
- Consistent and repeatable
- Objective
- 100% coverage

**Semi-automated review**
- Guided Workflows
- Streamlined processes
- Subjective
- Sampling
Semi-automated review methods

<table>
<thead>
<tr>
<th>Visual review</th>
<th>Data inspection</th>
<th>Positional accuracy</th>
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<tbody>
<tr>
<td>• Redlining</td>
<td>• Feature counts</td>
<td>• Assessment tool</td>
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<tr>
<td>• Systematic review</td>
<td>• Attribute review</td>
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<tr>
<td>• Sampling</td>
<td>• Version differences</td>
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ArcGIS Data Reviewer: An Introduction
Value of performing visual review

- Discover patterns
- Find missing features
- Compare against trusted sources
Semi-automated review
Leveraging ArcGIS Desktop

Tools supporting semi-automated review
- Selecting/browsing features
- Redlining missing features
- Flagging existing features in error
- Random sampling
- Assessing positional accuracy (ArcMap)
- Comparing geodatabase versions (ArcMap)
Semi-automated review
Leveraging ArcGIS Server

- Extending quality control workflows to other communities
  - QC review across the ArcGIS platform
  - Simple-to-use tools for error identification
  - Manual QC workflow “automation”
Demo: Visual data review
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
✓ Key attributes are populated and have the correct values
✓ All features should be collected within the area of interest

☑ Features should be accurately positioned
☑ Data collection processes should be streamlined
☑ All errors are corrected and verified
Managing quality results
Managing quality control
QC lifecycle management

Review
Find and record errors

Correct
Perform edits or Note exceptions

Verify
Acceptable or Unacceptable

ArcGIS Data Reviewer: An Introduction
Demo: Managing quality results
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
✓ Key attributes are populated and have the correct values
✓ All features should be collected within the area of interest
✓ Features should be accurately positioned
 Data collection processes should be streamlined
 All errors are corrected and verified
Workshop review

- Importance of data quality

- Forms of data quality control
  - Automated review
  - Semi-automated review

- ArcGIS Data Reviewer
  - Automated validation checks
  - Semi-automated tools
  - Error lifecycle management
  - Data quality reporting
<table>
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<tr>
<th>Day and Description</th>
<th>Type</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Tuesday, July 11</td>
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<tr>
<td>ArcGIS Data Reviewer:</td>
<td>An Introduction</td>
<td>Technical Workshop</td>
<td>10:15 – 11:30am</td>
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<tr>
<td>ArcGIS Data Reviewer:</td>
<td>Integrating Data Validation Capabilities into Web Applications</td>
<td>Demo Theater</td>
<td>3:30 – 4:15pm</td>
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<td>ArcGIS Data Reviewer:</td>
<td>Implementing Data Quality Reporting in Web Clients</td>
<td>Demo Theater</td>
<td>4:30 – 5:15pm</td>
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<td>Thursday, July 13</td>
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<td>ArcGIS Data Reviewer:</td>
<td>Advanced Data Validation</td>
<td>Technical Workshop</td>
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<td>ArcGIS Data Reviewer:</td>
<td>Leveraging Geoprocessing for Data Validation</td>
<td>Demo Theater</td>
<td>9:30 – 10:15am</td>
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<td>ArcGIS Data Reviewer:</td>
<td>Validating Linear-Referenced Events</td>
<td>Demo Theater</td>
<td>10:30 – 11:15am</td>
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Want to learn more this week?
Want to learn more?

Product information
www.esri.com/datareviewer
Want to learn more?

- Documentation
  - Desktop (desktop.arcgis.com)
Want to learn more?

- Documentation
- Desktop
- Server (server.arcgis.com)
Want to learn more?

• Documentation
  - Desktop
  - Server

• Training *(training.esri.com)*
  - 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)*
Want to learn more?

• Documentation
  - Desktop
  - Server

• Training
  - Assessing Data Quality using ArcGIS Data Reviewer
  - Evaluating Positional Accuracy Using ArcGIS Data Reviewer for Desktop
  - Data QC with ArcGIS: Automating Validation
  - Data QC with ArcGIS: Visual Review
  - Quality Control Using ArcGIS Data Reviewer for Desktop

• GeoNet (geonet.esri.com)
  - Data Reviewer place
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