Contents

• ArcGIS runs on data
• Geodatabase building blocks
• Rules for your data
  - Attribute
  - Spatial
• Advanced models
ArcGIS Runs on Data
Many data stores, many choices
Why use a geodatabase?

- Customizable
- Functionality
- Platform Integration
- Scalable
Two flavors

File geodatabase
- File System
- Single Editor

Enterprise geodatabase
- RDBMS
- Multiple Editor

Database options:
- Oracle
- SQL Server
- PostgreSQL
- DB2
- Informix
- SAP HANA
Creating a geodatabase Demonstration
Geodatabase Building Blocks
Table
Geodatabase building blocks

- Each row is a unique object
- Rows have same fields
- No spatial field

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Feature class
Geodatabase building blocks

• Collection of features
  - Same geometry type
  - Same spatial reference
  - Same attribute fields

• Extended functionality
  - Multi-part features
  - Z and M values
  - Annotation / Dimension
Attachments
Geodatabase building blocks

• Associate 1 or more files with a geographic feature
  - Stored within the geodatabase

• Accessible throughout the ArcGIS platform
  - Open files types recognized by OS
  - Download others

• Specialized implementation of a relationship class
Raster

Geodatabase building blocks

• Cell / Pixel-based data
  - Discrete / Continuous data
  - Multiple formats

• Geodatabase
  - Mosaic Dataset
    - Manage multiple rasters
    - Store as a catalog, view as a mosaic
    - Advanced querying and processing
  - Raster dataset
    - Manage single raster
Rules for your data
Rules for maintaining attribute data quality

- Subtypes
- Domains
- Contingent Values
- Relationship classes
- Attribute Rules
The problem

- Maintaining equivalent data in multiple files
Solution: Subtype
Geodatabase functionality – attribute integrity

- Define categories / classes
- Set rules for each field by category
  - Default values
  - Domains
  - Behaviors
- Property of table or feature class
The problem

• Editors want to be more efficient
• Editors make mistakes
  - Values out of range or invalid
  - Data entry errors
Solution: Domain

Geodatabase functionality – attribute integrity

- Specify valid values
  - List of valid values
  - Min and max value
- Apply to multiple attribute fields
- Property of geodatabase

**Coded Value Domain**

BusinessOccupancy in
("Single-Family Dwelling", "School", "Warehouse"…)

**Range Domain**

PercentValued between 1 & 100
Contingent Values
Geodatabase functionality – attribute integrity

- Extends the subtype/domain restrictions for valid input
  
  - Attribute value in one field is dependent on values from other attributes
The problem

- Owners and parcels are isolated in different tables
  - Need to relate owners to parcels, parcels to owner
  - A parcel can have many owners, an owner can own many parcels
The solution: relationship class
Geodatabase functionality – attribute integrity

- Define association between geodatabase objects
- 1:1, 1:M, M:N cardinalities
- Simple or composite
- Apply rules and attributes
- Edit across relationship
The problem

- Automatically calculate values for new records
  - Editors using ArcGIS Pro, web & mobile apps
- Validate new business rules on existing data
- Return errors for invalid values
The solution: attribute rules

Geodatabase functionality – attribute integrity

- Automatically populating/controlling field values for features on edit
- Arcade scripting language is cross-platform
  - edits performed anywhere (desktop, mobile, web)

Attribute rule types:
- **Calculation rules** – calculates value of field based on expression
  - Immediate – rule runs on edit
  - Batch – runs at specific time on all data
- **Constraint rules** – controls data entry, raises error for invalid data
- **Validation rules** – highlights errors on existing data
Rules for maintaining spatial data quality

- Feature datasets
- Topology
- Advanced features
Feature dataset

Geodatabase functionality – spatial data integrity

- Container for advanced datasets
  - Topologies
  - Networks
  - Parcels

- Single spatial reference

- Not a folder
  - Treated as a single object
The problem

- Need to easily identify spatial errors
- Need a series of rules to make sure that our parcels are accurate
The Solution: Geodatabase topology

Geodatabase functionality – spatial data integrity

• Manage shared geometry
  - Within a feature class
  - Between feature classes

• Rules-based
  - Select rules based on spatial relationships
  - Apply rules by validating data
  - Make corrections or mark exceptions
Advanced Models

- Advanced capabilities
- Industry-specific rules & models
  - Utility networks
  - Transportation networks
  - Parcel management
In conclusion

• ArcGIS runs on data
• Lots of data stores, lots of choices
• Geodatabase
  - Unique functionality
  - Data integrity rules
  - Advanced models
To learn more…

• Attribute data integrity:
  - Geodatabase: Setting Up Your Geodata Schema in ArcGIS Pro
  - Geodatabase: Leveraging Relationship Classes
  - Geodatabase: Ensuring Data Quality with Attribute Rules and Contingent Values

• Multi-user geodatabases:
  - Enterprise Geodatabase: Introduction to Multi-User Geodatabases
  - Enterprise Geodatabase: Introduction to Multi-User Editing

• Spatial data integrity
  - Geodatabase: Ensuring Data Quality with Topology
  - ArcGIS Pro Editing: Data Alignment and Management

• Networks
  - Utility Network Management in ArcGIS: Introduction to the Utility Network
  - Network Analyst: An Introduction

• Parcels
  - Parcel Editing: Managing Parcels with ArcGIS Pro
Questions?
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Select the session you attended.

Scroll down to “Survey”.

Log in to access the survey.

Complete the survey and select “Submit”.

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Select the session you attended.

Scroll down to “Survey”.

Log in to access the survey.

Complete the survey and select “Submit”.

Share your thoughts.

We need your feedback to improve our events.

Login to take surveys and share your feedback on the event, presenters, and sessions.

Understand why quality plays a key role in every organization that uses GIS data. Learn how to use ArcGIS Data Reviewer to improve data quality and reduce costs associated with poor quality. This session will focus on using ArcGIS Data Reviewer for data validation.

Title and Description Consistent with Content

Poor | Excellent

Well Organized/ Clear Presentation

Poor | Excellent

Public Speaking Skills

Poor | Excellent

The content of the workshop was relevant to my work.