

Introduction to GeoDatabase Lecture

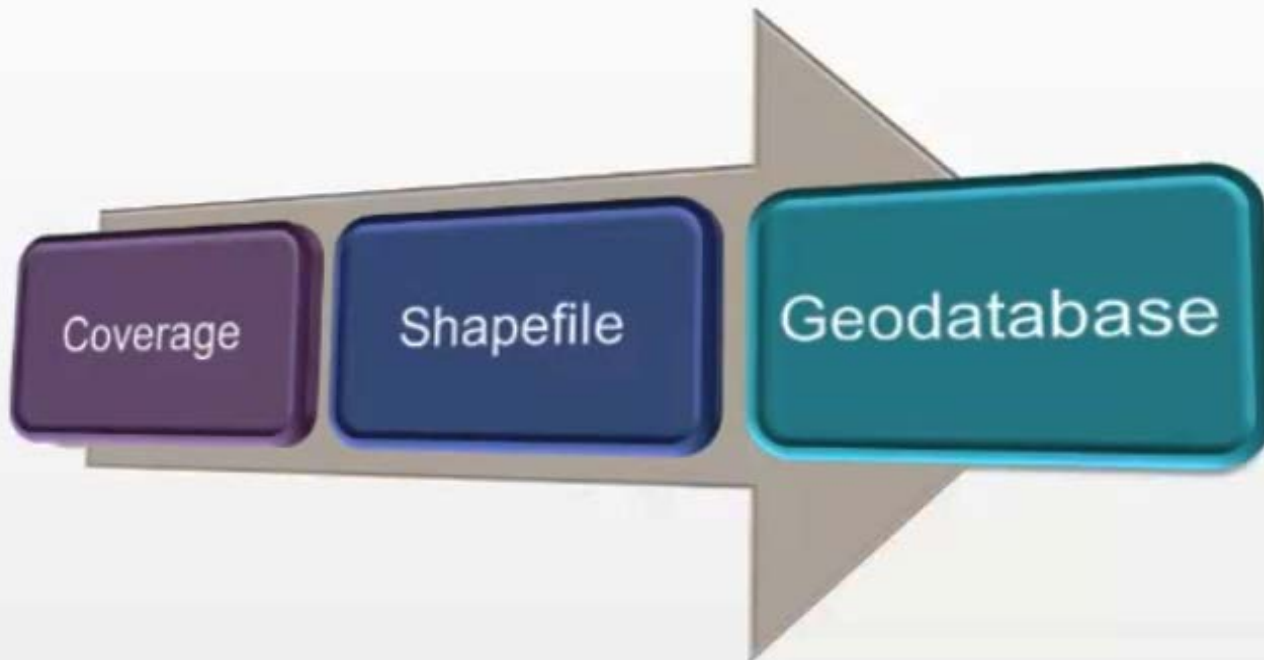
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Purpose of This Lesson

- This lesson will introduce you to the tools that are used to establish one of the 3 types of GDB, the personal GDB and will teach you the settings for creating a spatial layer that can take advantage of the functions of a GDB

History of Spatial Data Formats

- Let's take a look on how spatial data formats have evolved over the years.
- The data is visually the same but the formats have changed.



- Coverage and Shapefile stored in a directory or folder
- Feature class is stored inside the GDB


Coverage Vector Type

A single coverage can contain multiple vector types such as:

- Points
- Lines
- Polygons
- annotation along with label points for the annotation.

The ability to have multiple vector types within a single coverage is a very good feature.

GeoDatabase



Geodatabases

Definition:

Conceptually, GDBs are like storage units, which neatly organizing your data.

Or:

The geodatabase is a collection of geographic datasets of various types

GeoDatabase

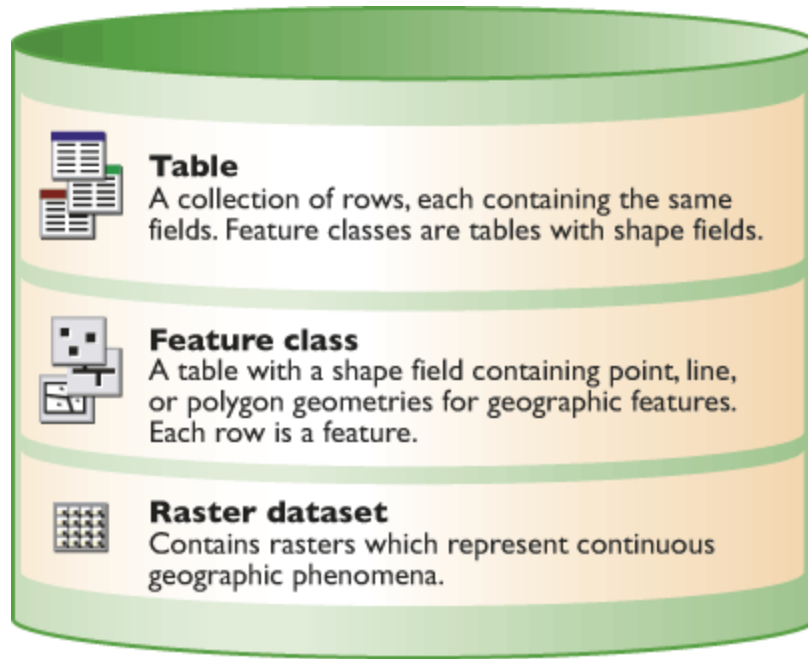


Geodatabases

Definition

The geodatabase is the native data structure for ArcGIS and is the primary data format used for editing and data management. While ArcGIS works with geographic information in numerous geographic information system (GIS) file formats, it is designed to work with and leverage the capabilities of the geodatabase.

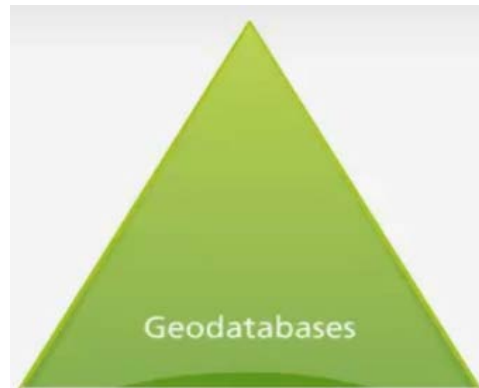
Fundamental datasets in the geodatabase



A key geodatabase concept is the dataset. It is the primary mechanism used to organize and use geographic information in ArcGIS. The geodatabase contains three primary dataset types:

1. Feature classes
2. Raster datasets
3. Tables

GeoDatabase



Import Data

Coverage
Shapefiles
CAD
Table
Rasters



The oil drum represents a
Geodatabase

New Data

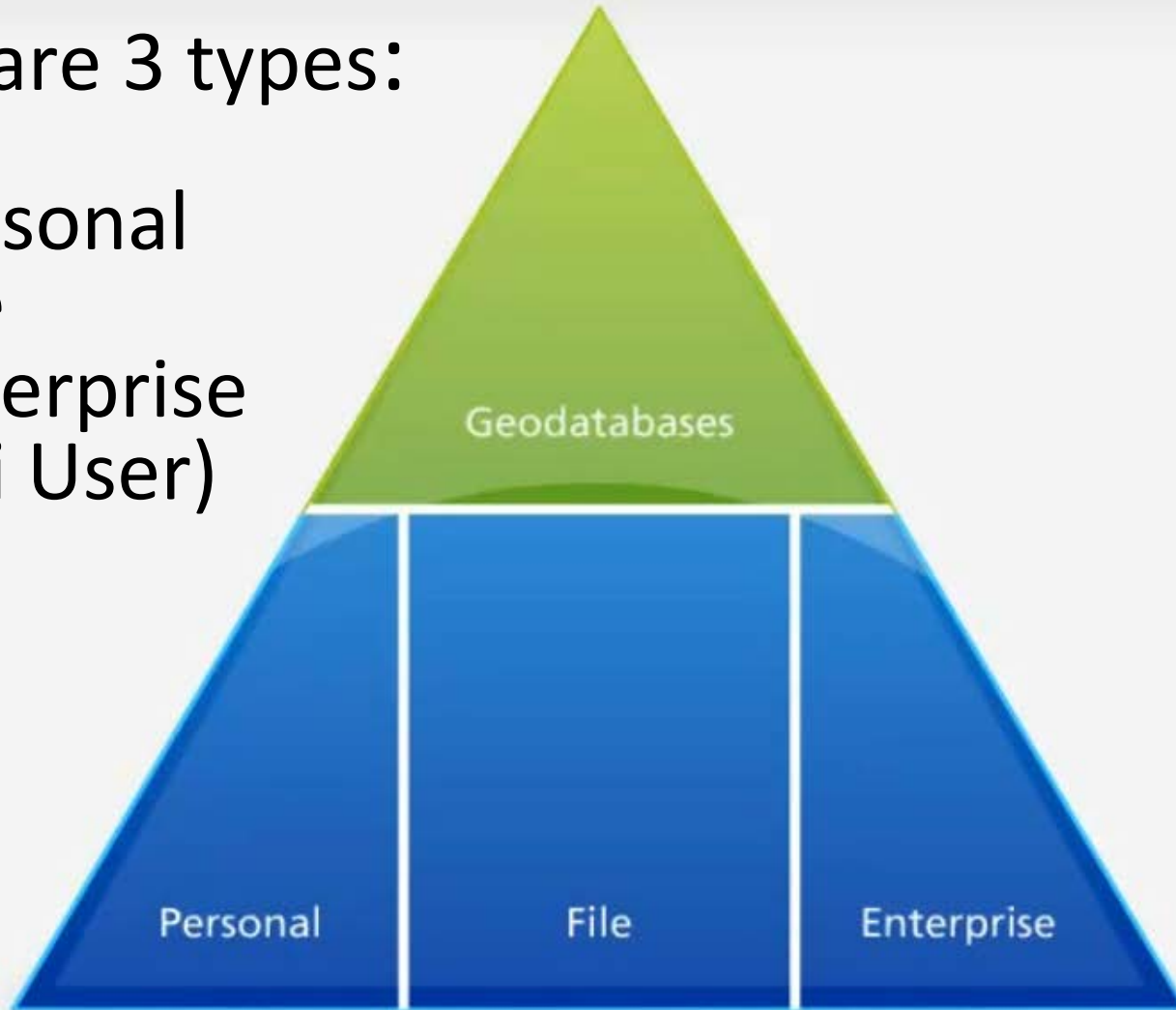
Points
Lines
Polygons
Annotation
Tables



GeoDatabase Pyramid

There are 3 types:

- 1- Personal
- 2- File
- 3- Enterprise
(Multi User)



Types of geodatabases

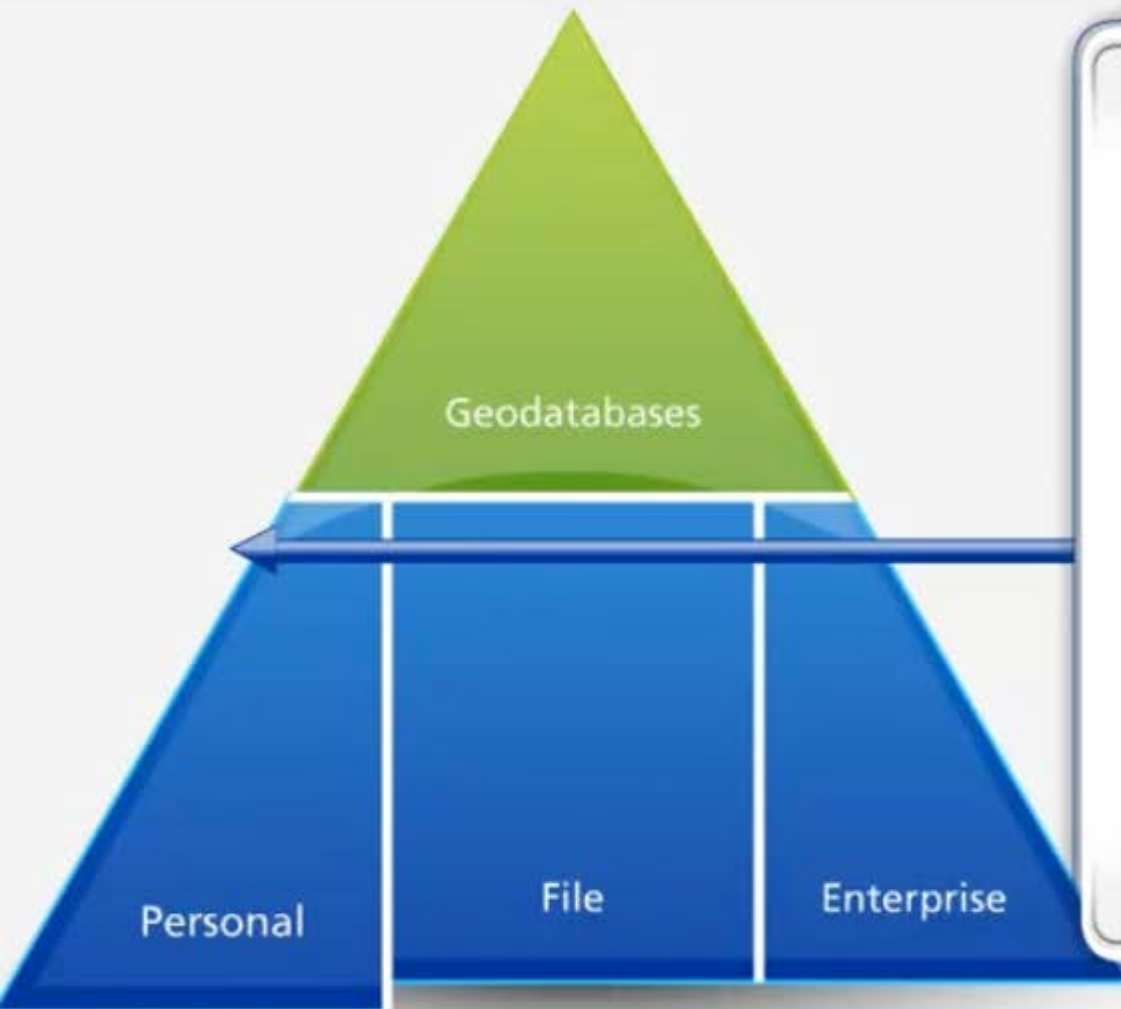
The geodatabase is a "container" used to hold a collection of datasets. There are three types:

File geodatabases: Stored as folders in a file system. Each dataset is held as a file that can scale up to 1 TB in size. The file geodatabase is recommended over personal geodatabases.

Personal geodatabases: All datasets are stored within a Microsoft Access data file, which is limited in size to 2 GB.

ArcSDE geodatabases: Stored in a relational database using Oracle, Microsoft SQL Server, IBM DB2, IBM Informix, or PostgreSQL. These multiuser geodatabases require the use of ArcSDE and can be unlimited in size and numbers of users.

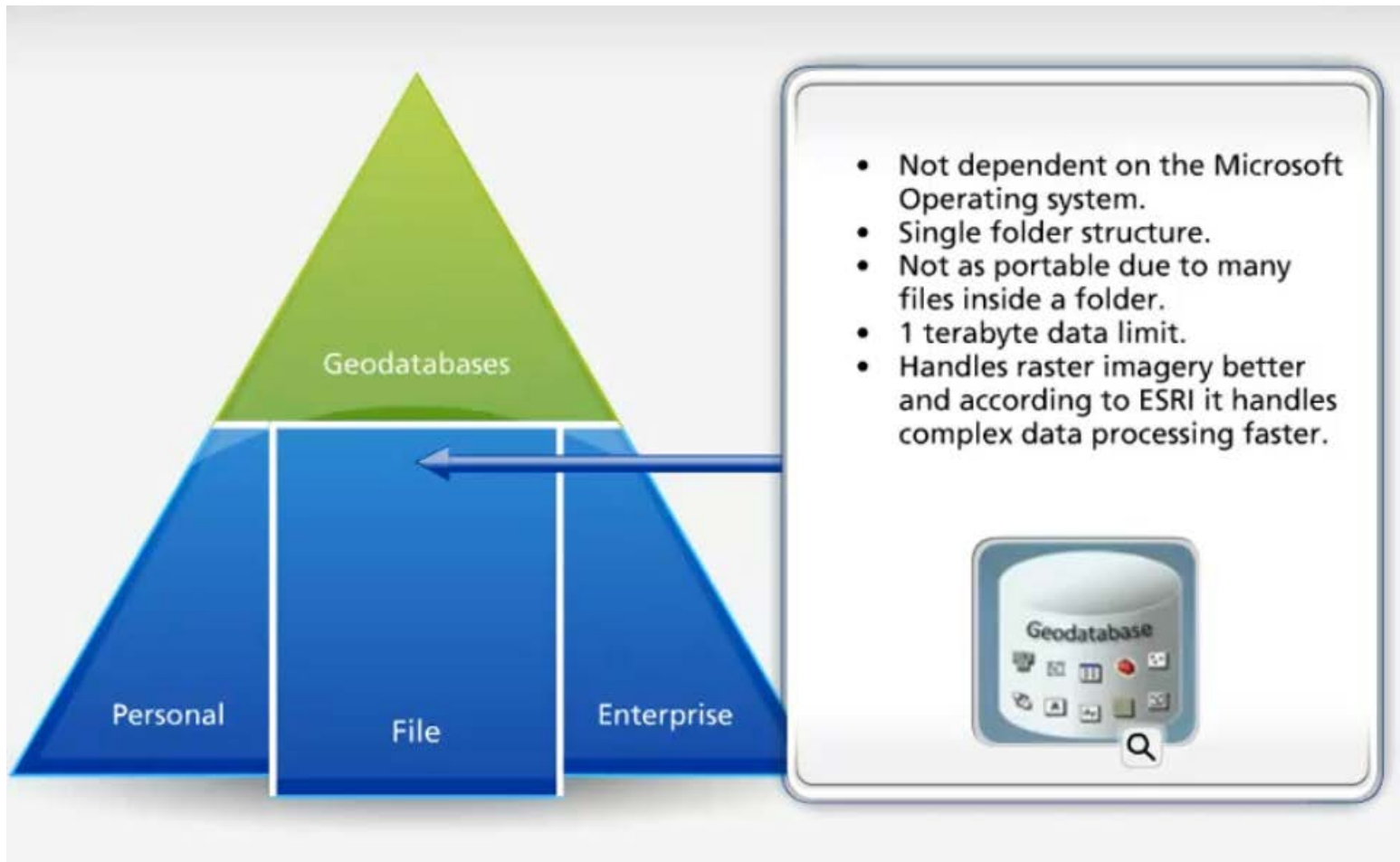
Personal GDB



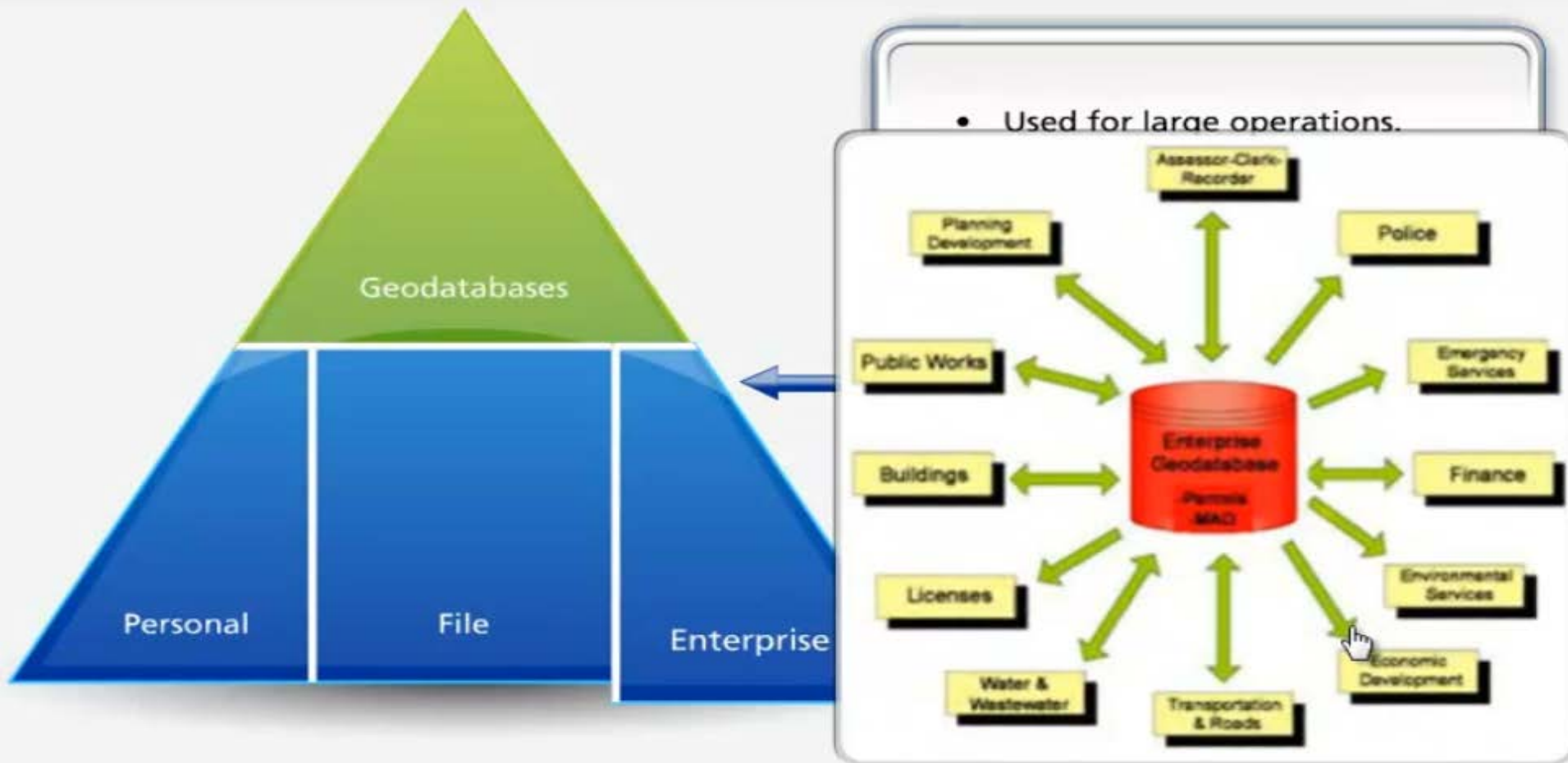
- You will use Microsoft Access database format.
- Single file on your computer with multiple data components inside.
- Easily portable.
- 2 Gigabyte data limit.
- Single user at a time for edits.



File GDB



Enterprise GDB



Used for large operations
Extremely Complex
Not discussed in depth

Requirement for Enterprise GDB

- ArcEditor or ArcInfo
- ArcSDE to manage connection to relational database.
- Relational Databases:
 - Oracle
 - SQL Server
 - Informix
 - DB2



You will also need

- A large amount of money, as all of that software is expensive.



Street Price:

Arc Info \$ 10 000

MS SQL Server Ent \$ 39 000

Arc SDE Several Thousands \$

- A vast amount of knowledge, as this software is complex.



Skilled Professionals To
Operate the System

Benefits of Personal & File GDB

- Portability and Data Management
- Shape Area and Shape Length
- Attribute Domains
- Annotation
- Raster Management
- Topology



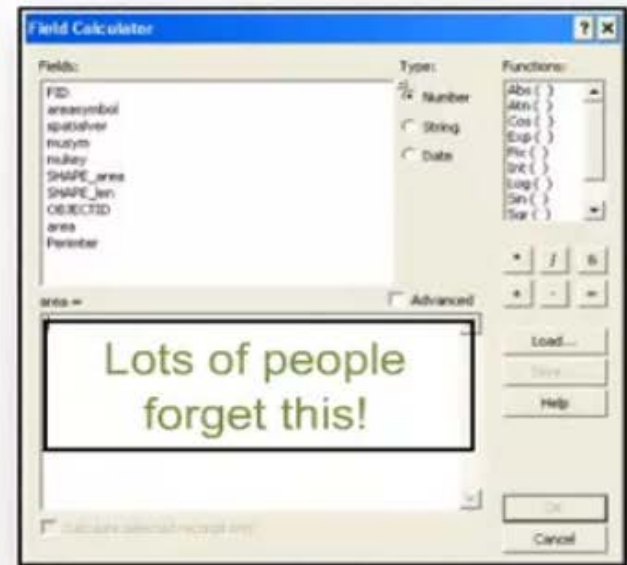
Portability & Data Management

- Ability to have lots of different spatial files in one neat location is beneficial.
- Backup of data is simplified.
- Easy to share data with others.
- Easier to document data.
- Improved database format



Shape Area & Shape Length 1

- If you edit Polygon A to look like the Polygon B, as pictured here, what has changed?
- If the spatial data is in a shapefile format, you must manually recalculate area and perimeter using the field calculator after an edit, or any other operation that changes geometry such as re-projection.



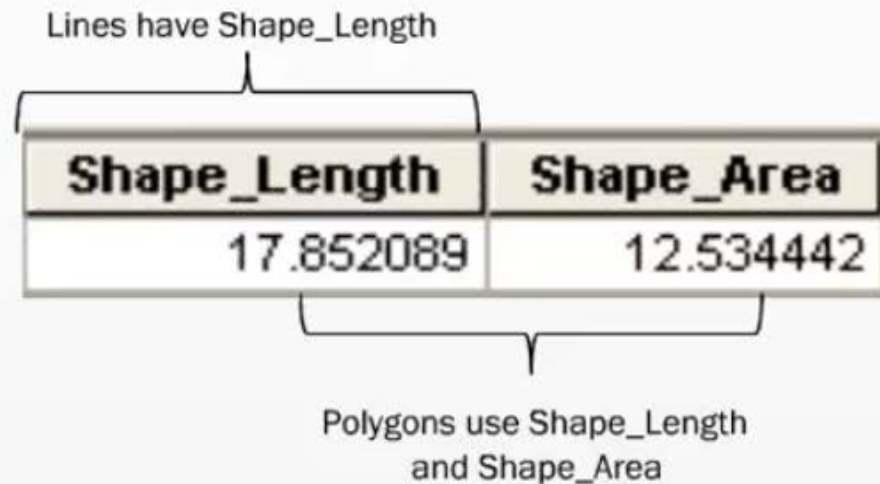
Shape Area & Shape Length 2

- In a geodatabase these area and perimeter fields are automatically generated and updated when a geometry change occurs.

Lines have Shape_Length

Shape_Length	Shape_Area
17.852089	12.534442

Polygons use Shape_Length and Shape_Area




This prevents users from forgetting to update these values.

Annotation (Text or Label)

- A geodatabase allows you to create what is known as an annotation feature class.
- Previous issues related to annotation with coverages and shapefiles are resolved with the Geodatabase.



Raster Management

- You can manage large raster data sets within a geodatabase.
 - Aerial imagery raster catalogs.
 - Pictures linked to individual spatial features.
 - Accessible through Identify  button in raster field and through hyperlink fields.



End

Thanks for being Patient

Any ?