GIS

An organized collection of computer hardware, software, geographic data, processes and personnel designed to capture, store, update, manipulate, analyse and display geographically referenced data


Software
Hardware
GIS
Data
People
Methods

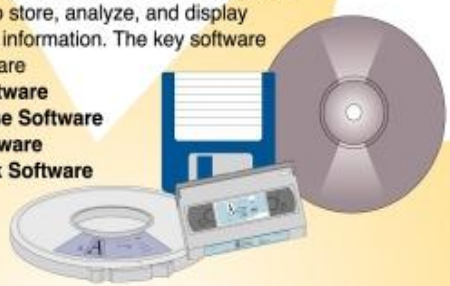
A Geographic Information System (GIS) links locational (spatial) and database (tabular) information and enables a person to visualize patterns, relationships, and trends. This process gives an entirely new perspective to data analysis that cannot be seen in a table or list format. The five components of a GIS are listed below.

GIS

SOFTWARE

GIS software provides the functions and tools users need to store, analyze, and display geographical information. The key software components are

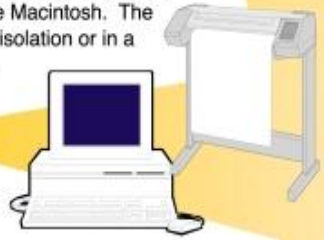
- **GIS Software**
- **Database Software**
- **OS Software**
- **Network Software**



HARDWARE

The hardware is the computer and peripherals on which the GIS operates. Today, this could be a centralized computer server running the UNIX or Windows NT operating systems, a desktop PC, or an Apple Macintosh. The computer may operate in isolation or in a networked configuration.

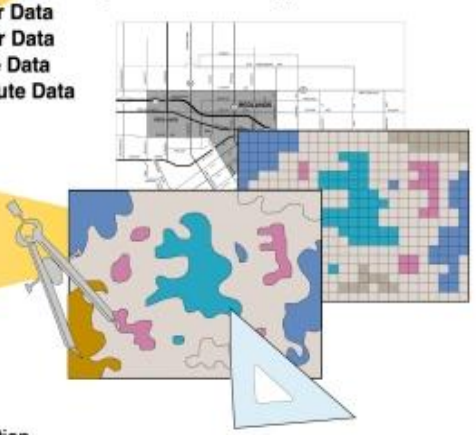
- **Computers**
- **Networks**
- **Peripheral Devices**
  - **Printers**
  - **Plotters**
  - **Digitizers**



DATA

One of the most important component of GIS is the data. It is absolutely essential that data be accurate. The following are different data types:

- **Vector Data**
- **Raster Data**
- **Image Data**
- **Attribute Data**



PEOPLE

GIS technology is clearly of limited value without people to manage the system and to develop plans for applying it. Users of GIS range from highly qualified technical specialists to planners, foresters, and market analysts who use GIS to help with their everyday work.

- **Administrators**
- **Managers**
- **GIS Technicians**
- **Application Experts**
- **End Users**
- **Consumers**

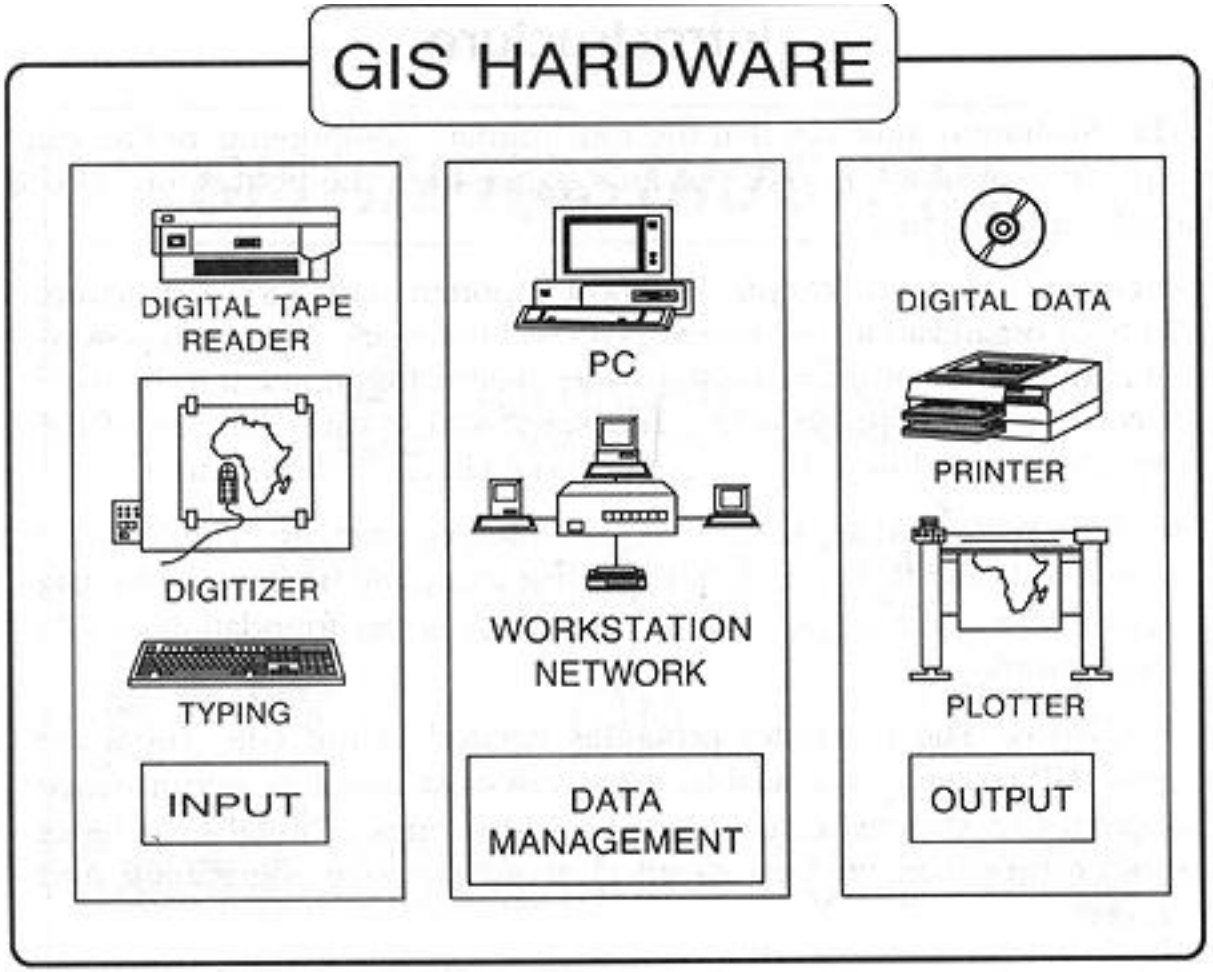
METHODS

Methods are well designed plans and application-specific business rules describing how technology is applied. This includes the following:

- **Guidelines**
- **Specifications**
- **Standards**
- **Procedures**

Hardware

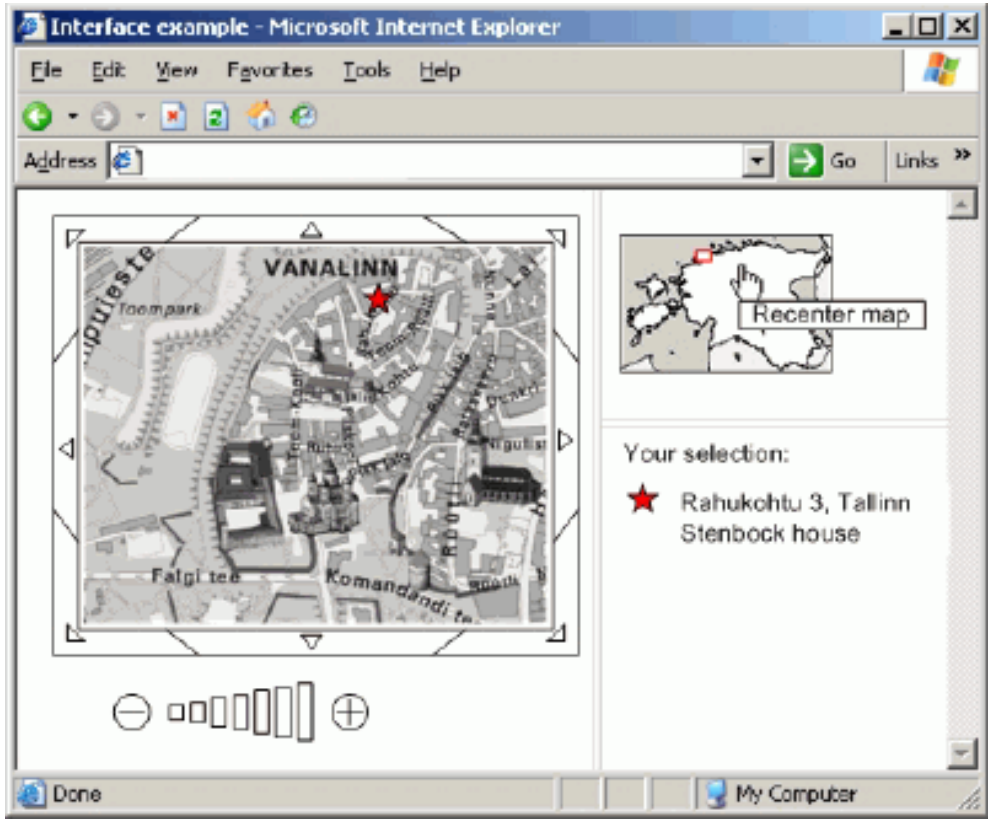
All the equipment used in the GIS Process



Software

The computer programs used to

capture, store, update, manipulate, analyse and display geographically referenced data

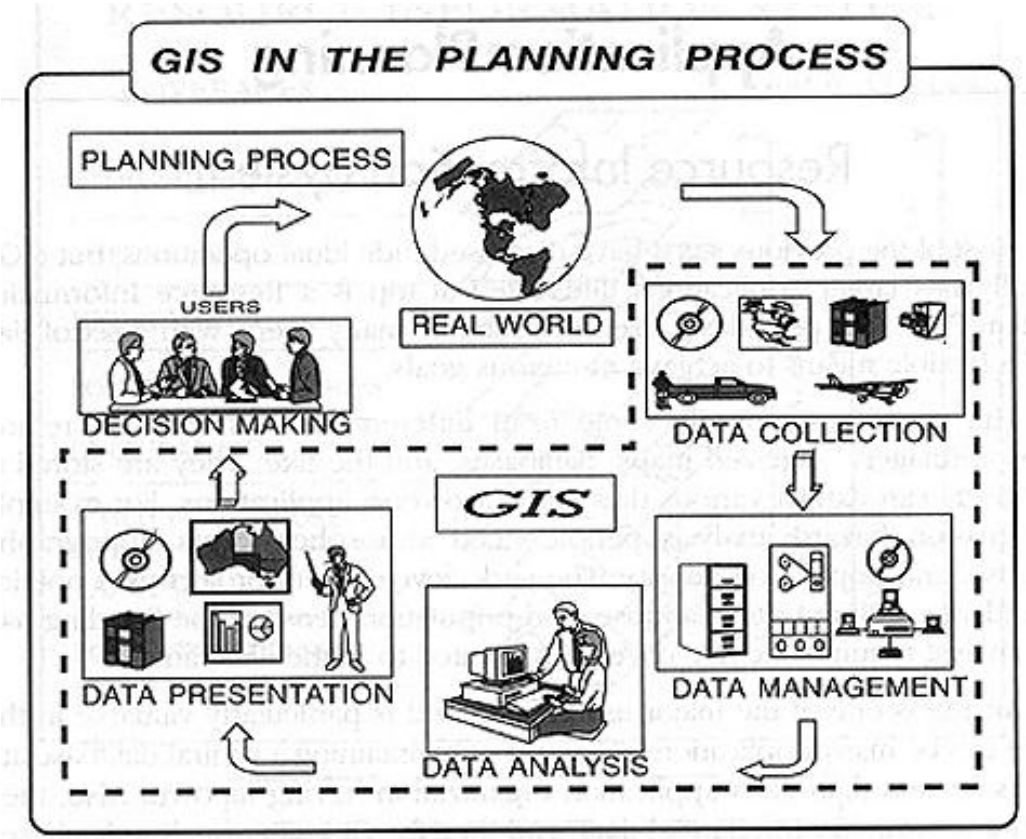


PEOPLE

The people making use of GIS to solve Geographical problems and those who develop and maintain the GIS software

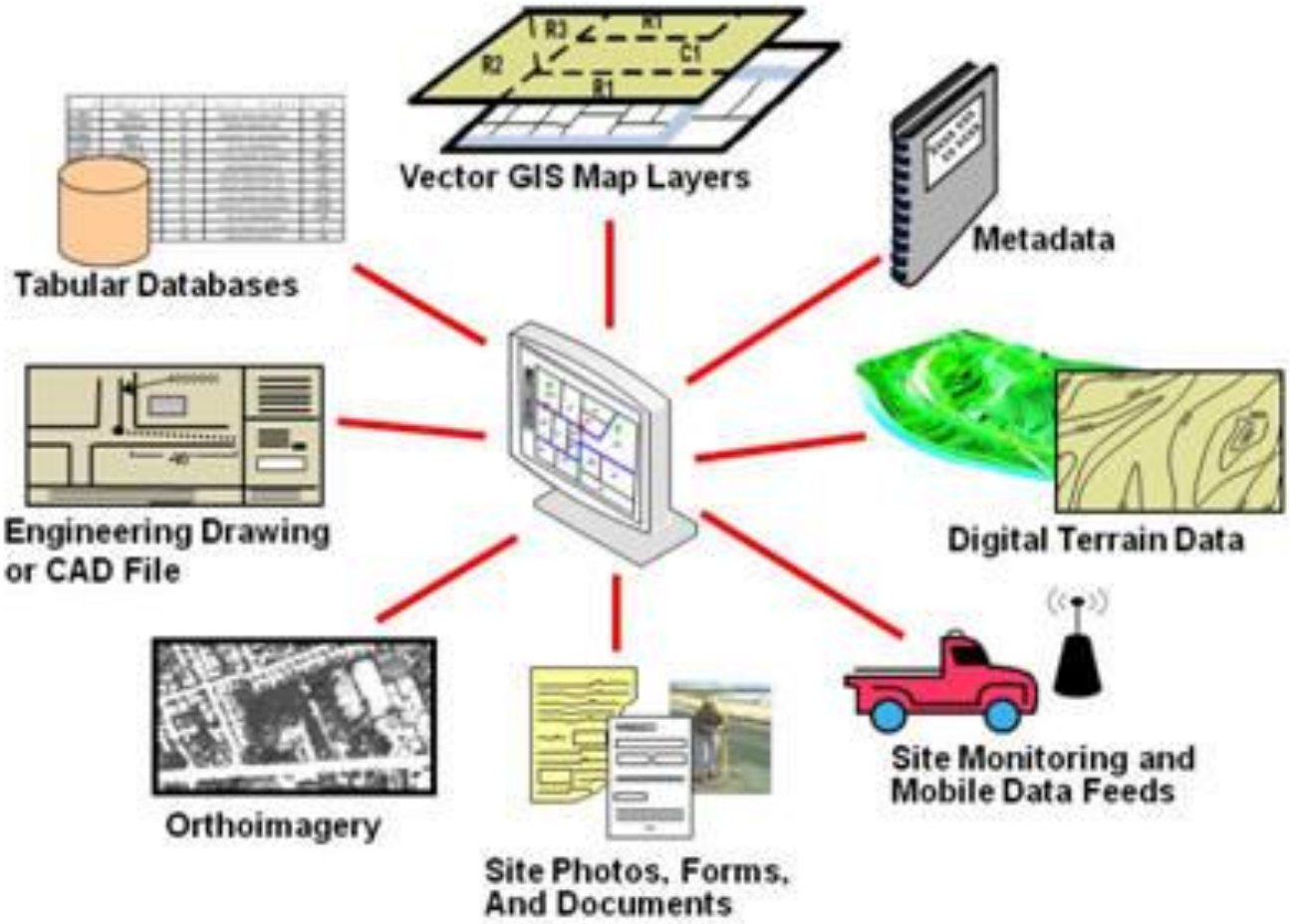
PROCESSES

The functional elements of a GIS – the processes that makes the GIS works - capture, store, update, manipulate, analyse and display



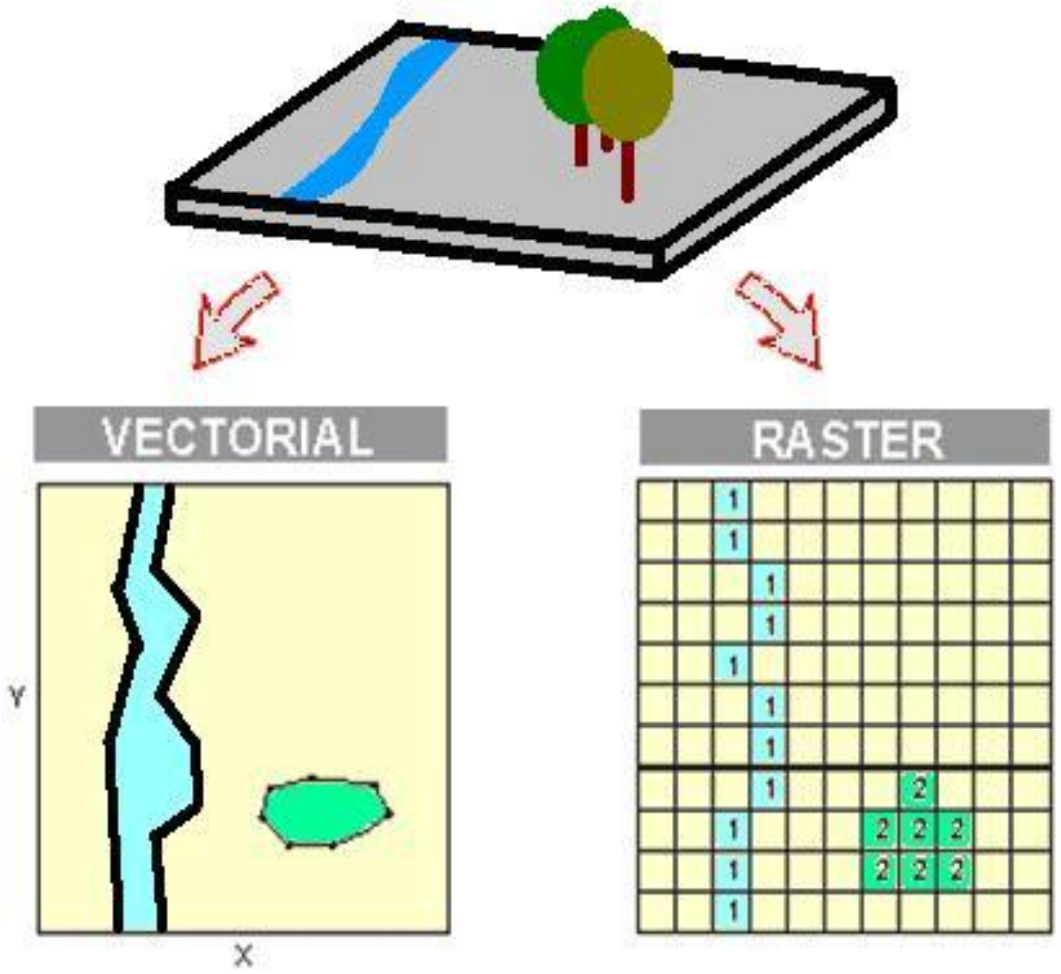
DATA

The facts stored in a GIS that represents the real world



SPATIAL DATA

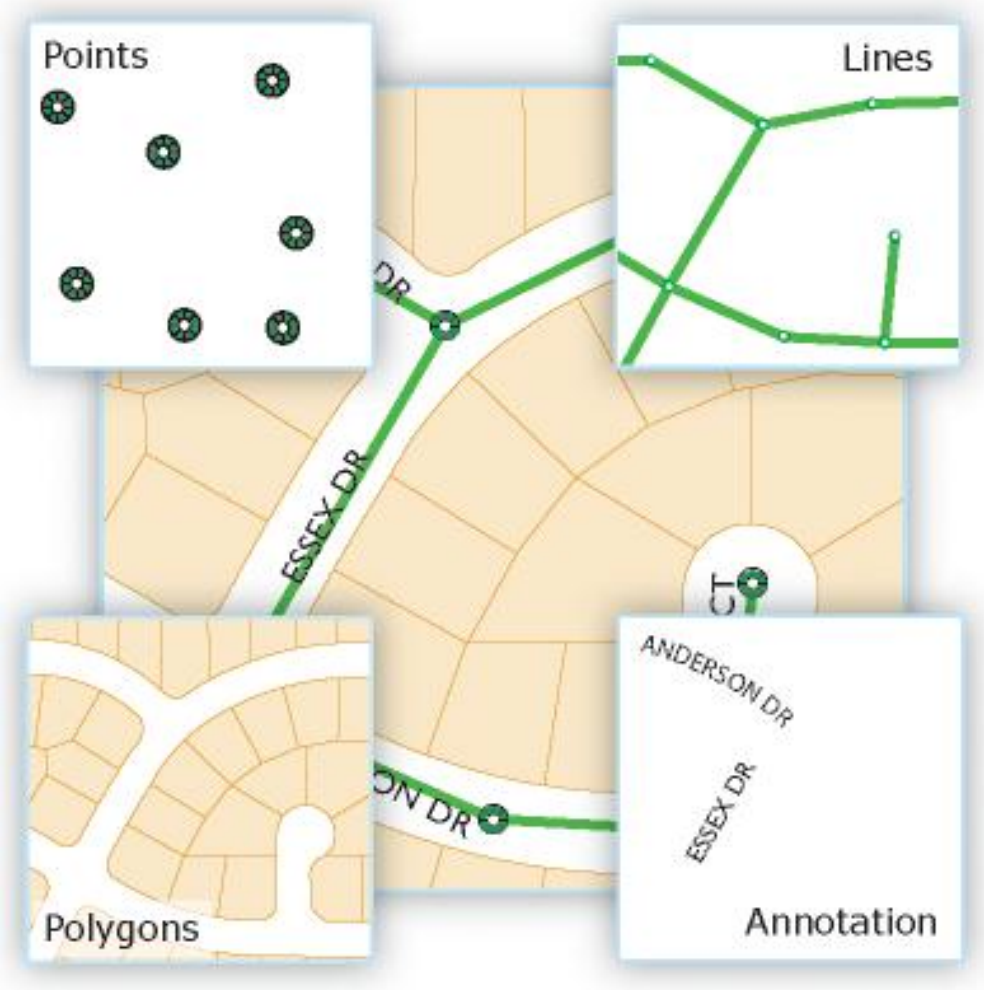
Data about the shape and the location of Geographical features – linked to place on Earth with coordinates and a projection.



Vector data

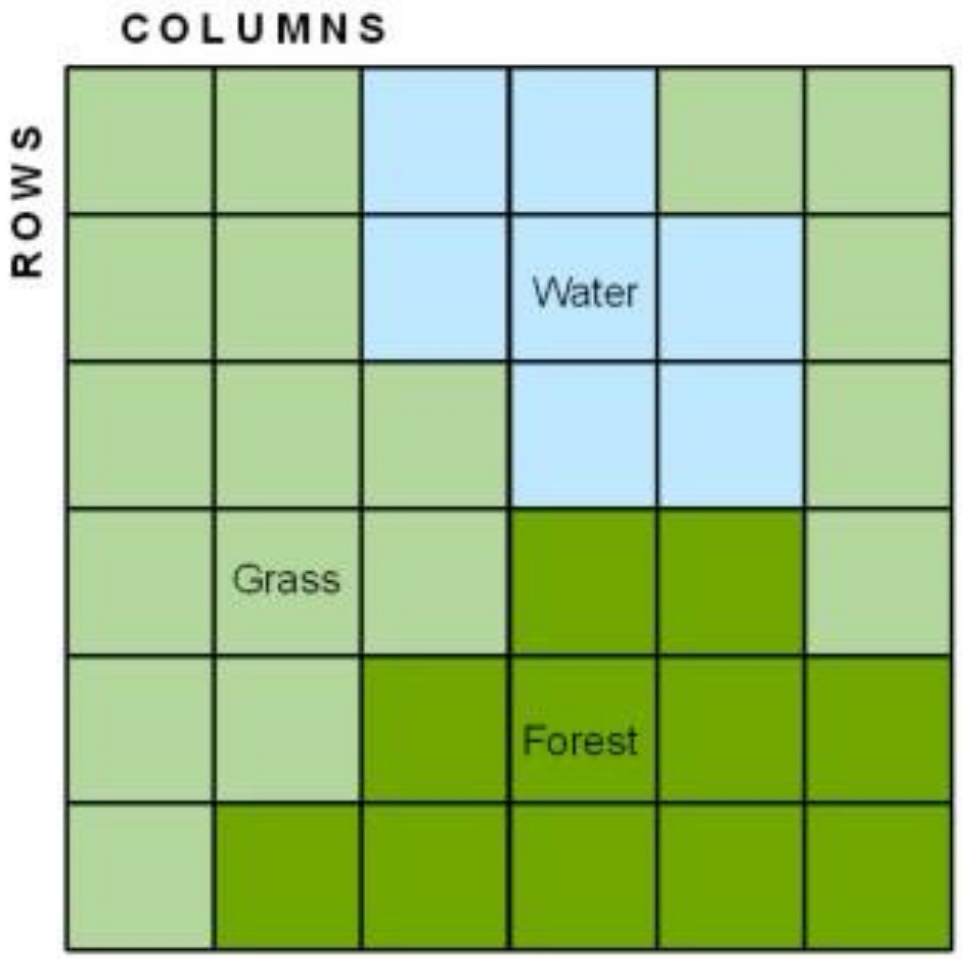
Points lines and polygons are used to store and represent geographical features in a GIS.

X,Y – cartesian plane



RASTER DATA

Real world features are displayed as pixels in a grid in the GIS.

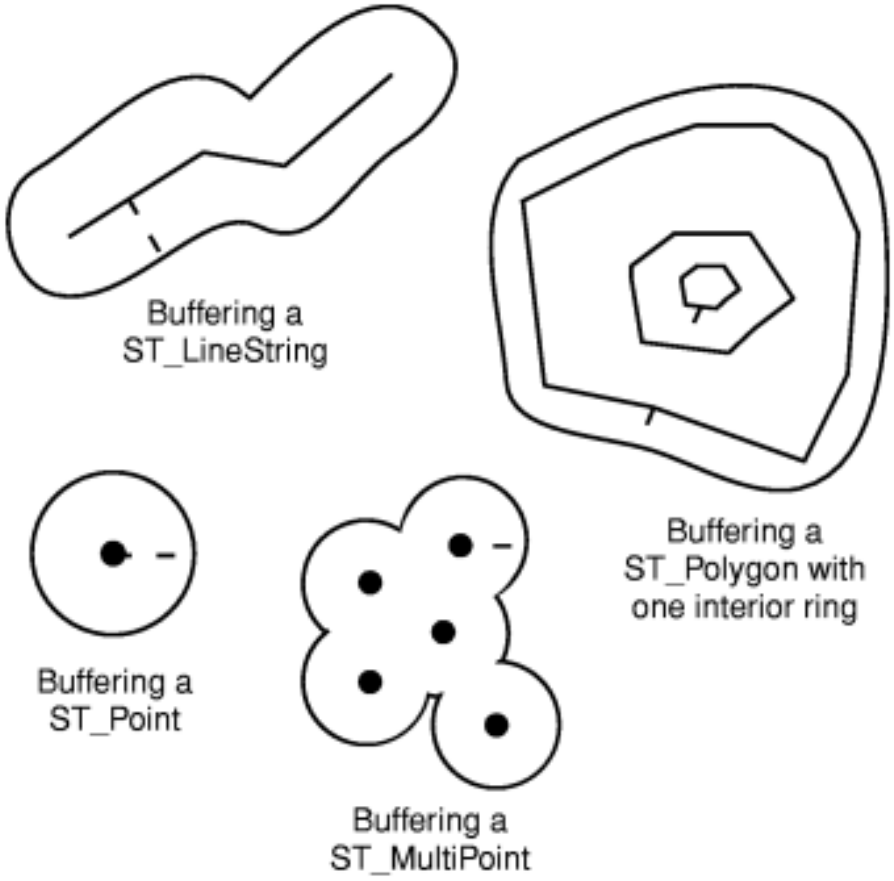


ATTRIBUTE DATA

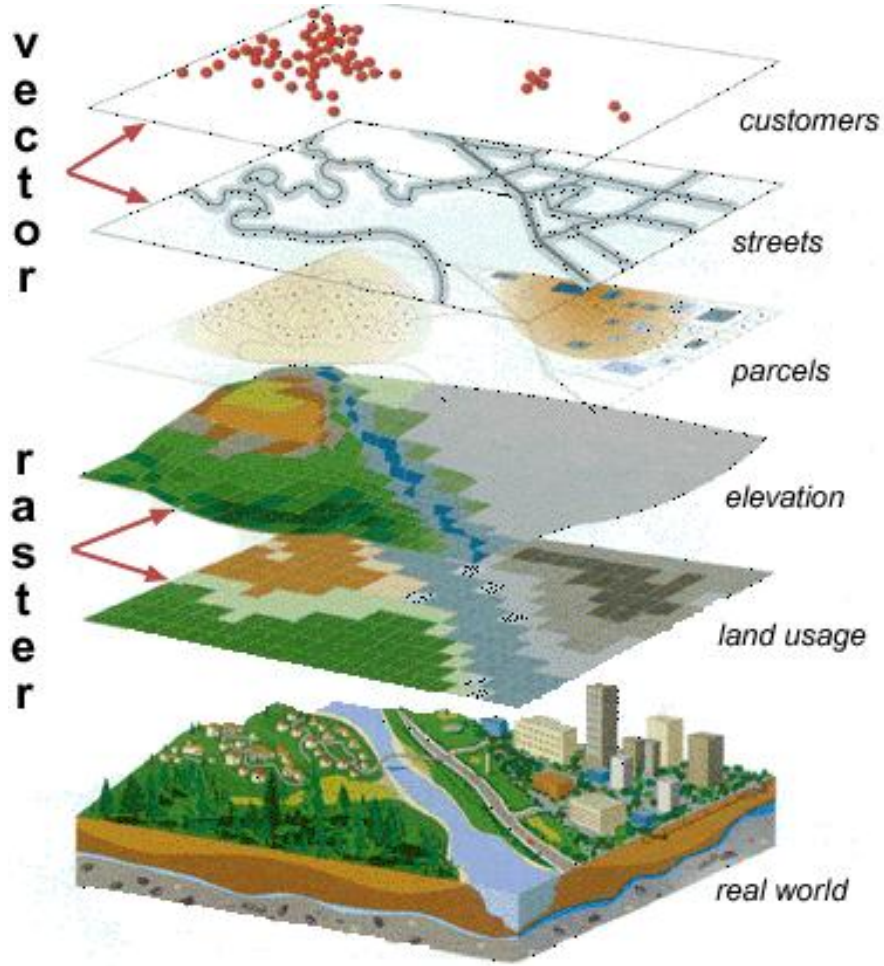
Data that describes Geographical features – identify, classify, categorise, quantify and qualify stored in tables and displayed as labels, symbols, map legends.

SPATIAL ANALYSES

Buffers

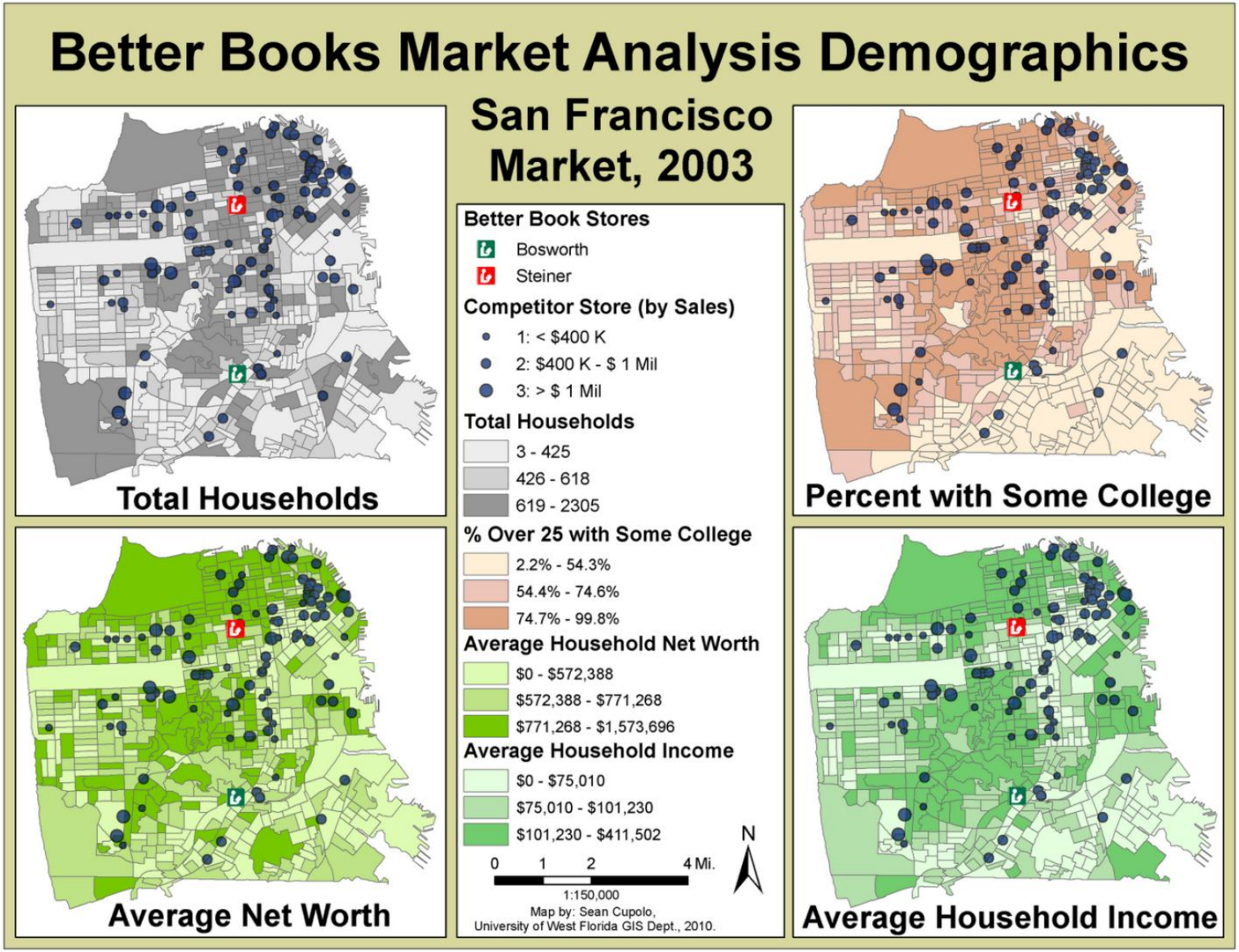


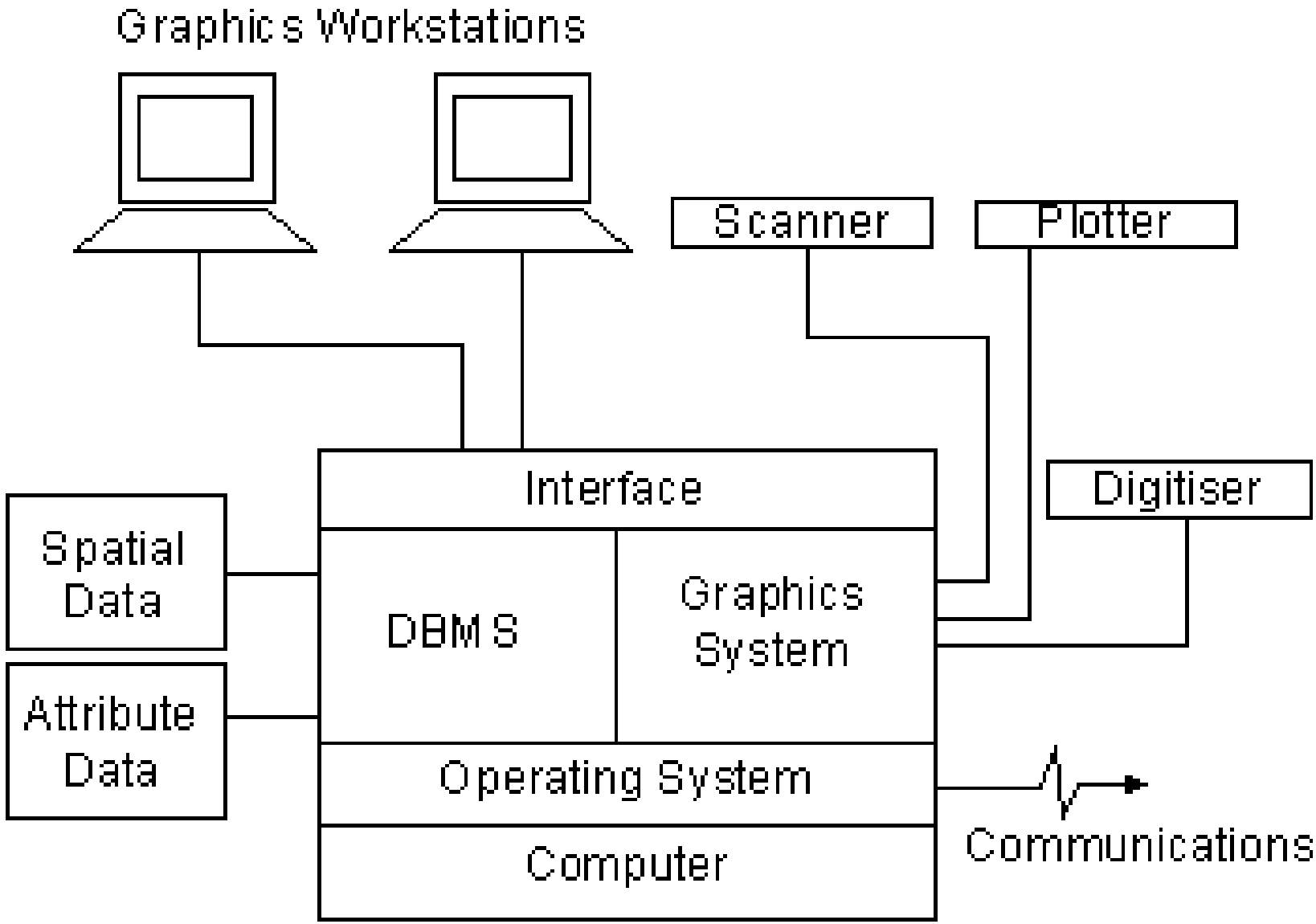
Overlays



STATISTICAL ANALYSYS

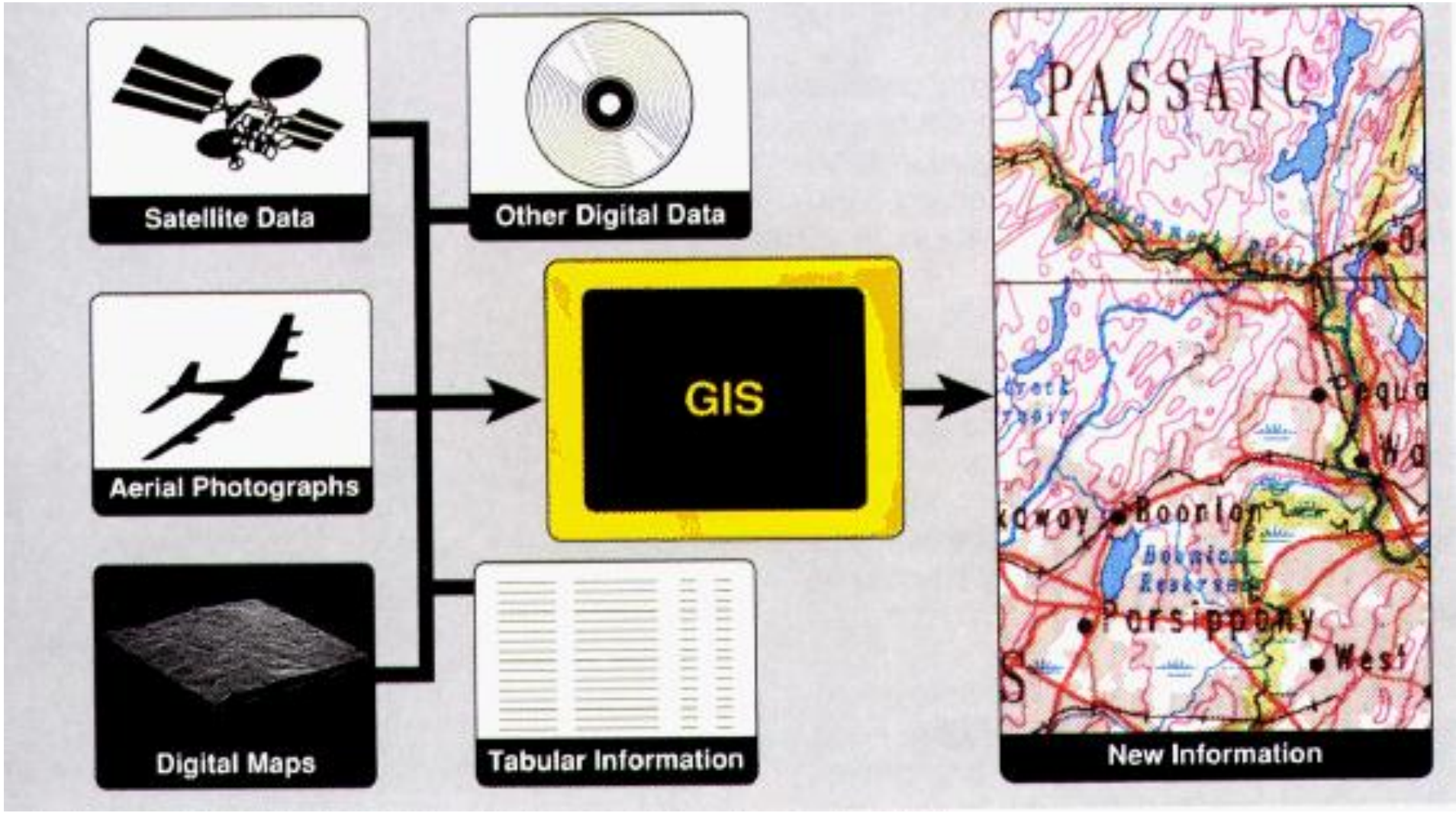
Sort, categorize, order numerical attribute data



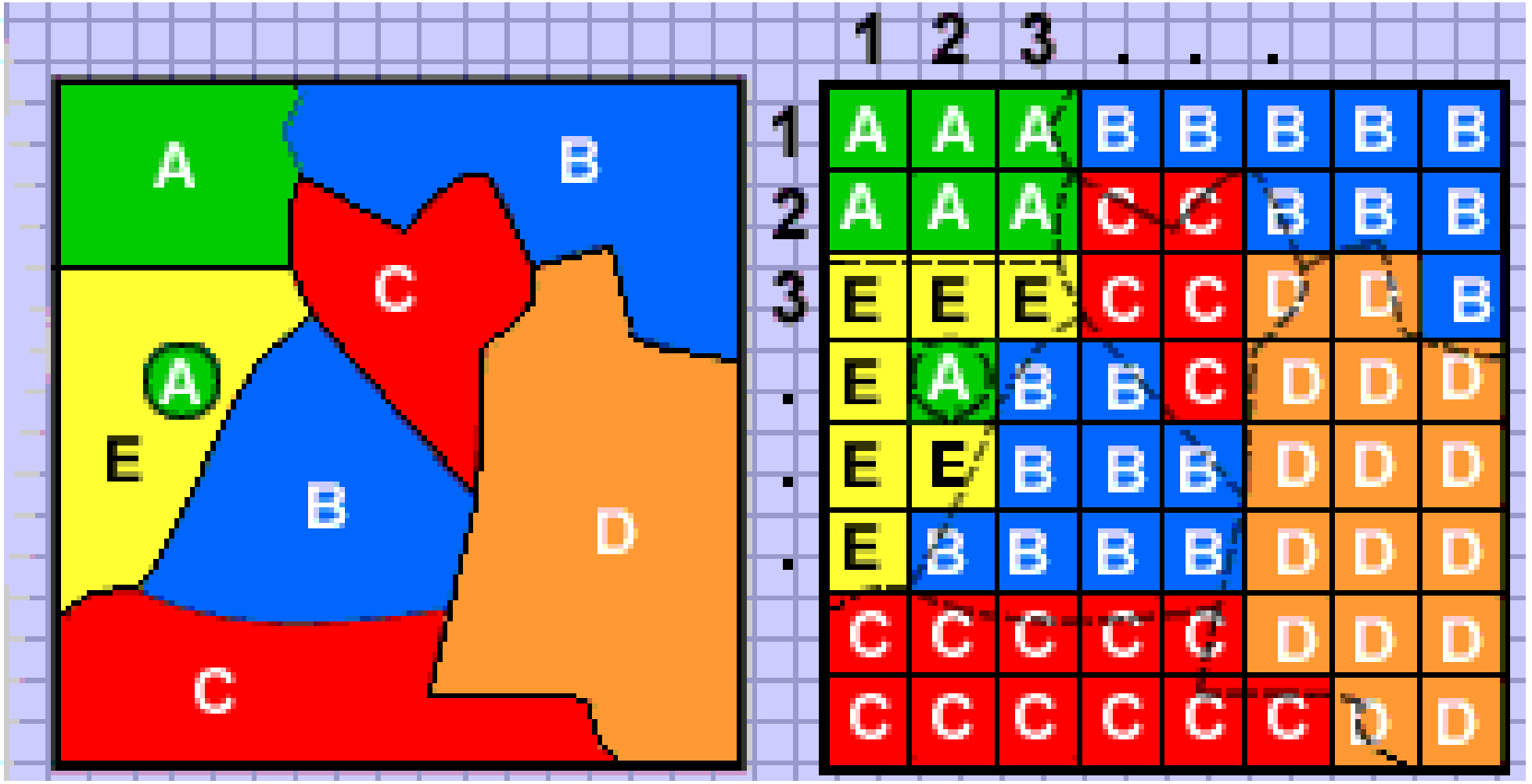


The physical components of a GIS

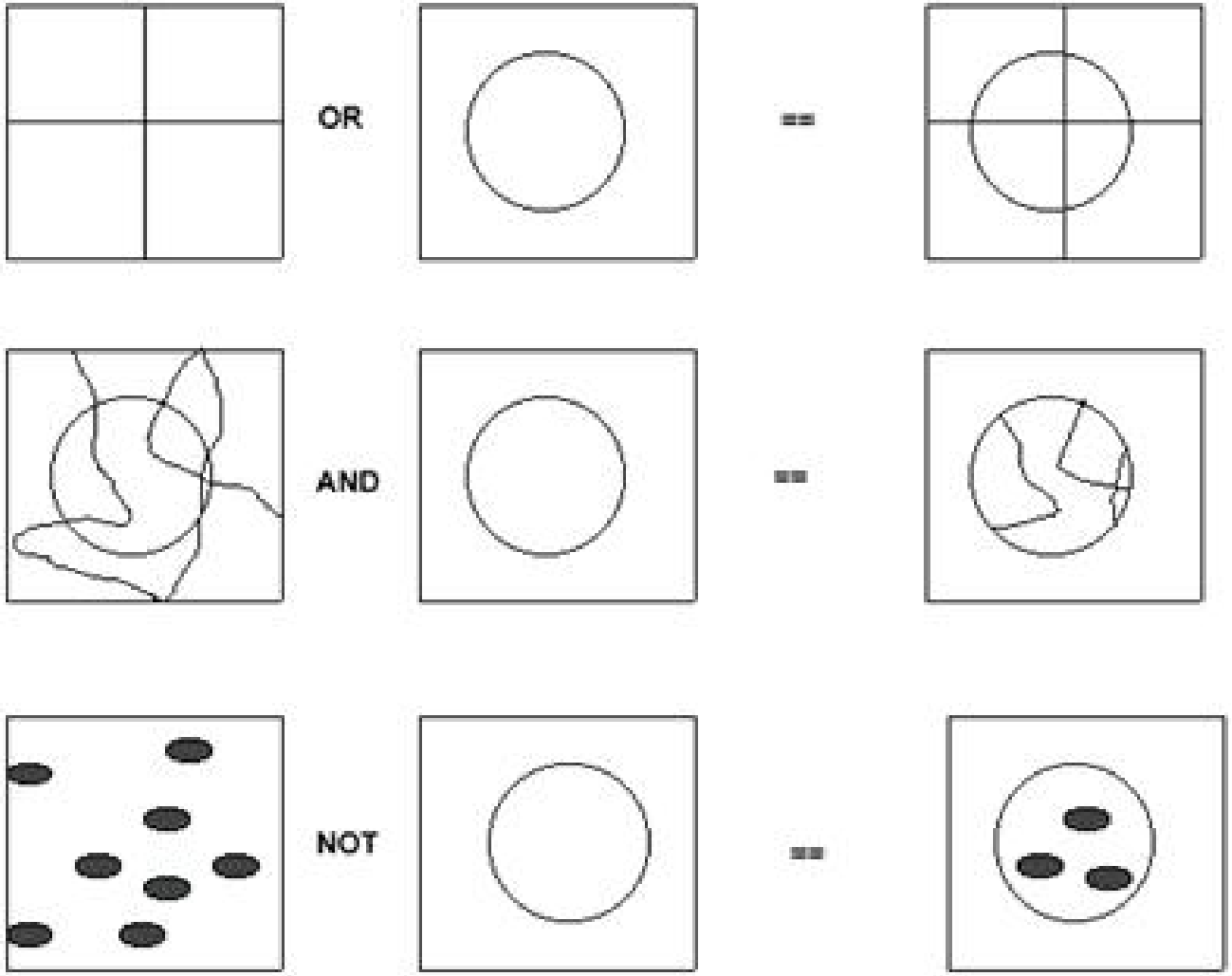
INPUT/OUTPUT



SPATIAL DATA FORMATS



SPATIAL OVERLAYS



FUNCTIONAL ELEMENTS OF GIS

Processes capture, store, update, manipulate, analyse and display geographically referenced data