CARTOGRAPHY & ADVANCED TECHNOLOGIES

❖ Geographical Information System (GIS)

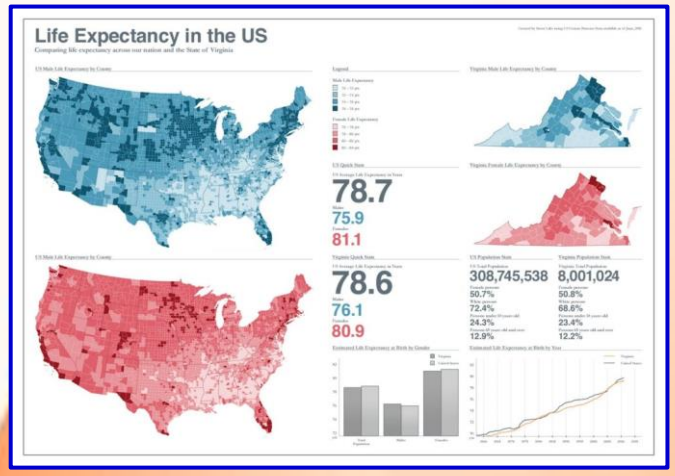
- GIS-is a geographic information system to capture, store, manipulate, analyze, manage, and present spatial or geographic data.

❖ Electronic Atlases

- The electronic atlas is one product of an Electronic Mapping System (EMS), which is a system for the development and/or the use of electronic maps.
- A digital atlas which consist of a collection of maps; it is typically a bundle of maps of Earth or a region of Earth.

❖ Geovisualization

- Concerns the visual representations of geospatial data and the use of cartographic techniques to support visual analytics. Refers to a set of tools and techniques supporting the analysis of geospatial data through the use of interactive visualization.
- Examples of geovisualizations would be a dot density map to show clustering of disease cases; a heat map that shows where weather movements are occurring; points identifying major cities; etc. Your visualization and analysis is driven by your data, your data's complexity, and your data's level of detail.



CARTOGRAPHY & ADVANCED TECHNOLOGIES

❖3D GIS

- A representation of a three-dimensional, real-world object in a map or scene, with elevation values (z-values) stored within the feature's geometry.

❖Mobile Mapping

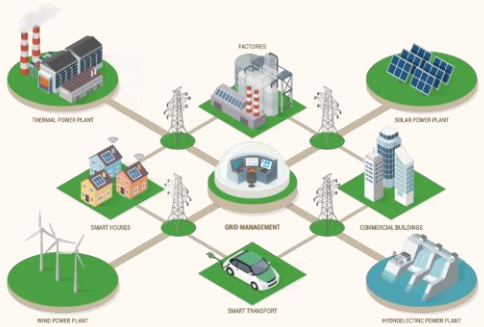
- The process of collecting geospatial data from a mobile vehicle, typically fitted with a range of photographic, radar, laser, LiDAR or any number of remote sensing systems.

❖ Virtual Reality (VR)

- The use of computer technology to create a simulated environment. Thus, it can simulate as many senses as possible, such as 3D view, vision, hearing, touch, even smell. The computer is also transformed into a gatekeeper to this artificial world.

CARTOGRAPHY & ADVANCED TECHNOLOGIES

❖ Geospatial Big Data

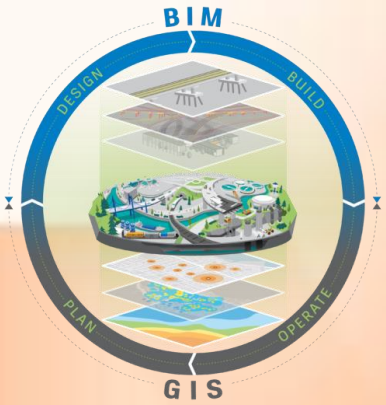


- Refers to spatial dataset exceeding capacity of current computing systems.
- Example: Data for Urban Planning and Infrastructure Development
- Importance: Improved Planning and Resource Allocation

❖ Internet of things (IoT)

- Refer to a system resembling computer devices, mechanical and digital machines, objects, animal or people.
- It is Provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human to human or human to computer interaction.
- Examples: Smartphones/Smart Refrigerators/Self Driving Cars
- Importance: Better decision making and real time tracking and monitoring.

❖ BIM in Geospatial



- BIM is acronym for Building Information Modelling, the most promising developments in the architecture, engineering and construction industries.
- 3D depiction of Physical and functional characteristics of building assets.
- Provide an integrated database for the building and infrastructure assets and geometrical data of the associated assets.
- Importance: Resources of information that is shared and support document management, trade coordination, team collaboration and 4D construction sequencing. Help decision making throughout the project life cycle.

CARTOGRAPHY & ADVANCED TECHNOLOGIES

❖ IR 4.0 in Geospatial and Mapping

- Refer to ongoing technological transformation characterized by the integration of digital technologies, automation, AI and IoT manufacturing and services.
- Importance: Enabling data driven decision making, increased productivity, posing challenges of reskilling, cybersecurity and society impact.
- Application: Smart Cities and Urban Planning, Precision Farming, Disaster Management and Emergency Response.

❖ Crowdsourcing

- Crowdsourcing is the collection of information, opinions, or work from a group of people, usually sourced via the Internet.
- Crowdsourcing offers many possible benefits to consumers and companies alike. It is often used for generating consumer reviews of products and services— example mapping section, user can update and give feedback on how to improve the works.
- People involved in crowdsourcing sometimes work as paid freelancers, while others perform small tasks voluntarily.
- For example, traffic apps like Waze encourage drivers to self-report accidents and other roadway incidents to provide real-time, updated information to app users.

❖ Open-Source Mapping

- If a program is open-source, its source code is freely available to its users.
- Open geospatial data and tools are an increasingly important paradigm offering the opportunity to promote the democratization of geographical information, the transparency of governments and institutions, as well as social, economic and environmental opportunities.
- Open Source Mapping Software: GRASS GIS/QGIS
- Importance: User can easily access the sources with low cost compared to desktop processing software. Able to provide efficient mapping results.