WORKING WEEK 2025
AND Locate25 THE NATIONAL GEOSPATIAL CONFERENCE
Collaboration, Innovation and Resilience: Championing a Digital Generation
FIG Geospatial Council of Australia
Brisbane, Australia 6–10 April

The Future of Spatial Data

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You can see me!

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PLATINUM SPONSORS Australian Government CHCNAV esri THE SCIENCE OF WHERE Leica Geosystems HD Meter Surveyors Australia

The most relevant SDGs related to the presentation and theme of this presentation

1st relevant SDG

2nd relevant SDG

3rd relevant SDG

SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals

Agenda

Created by Copilot

- Historical Context of Spatial Data
- Current State of Spatial Data
- Emerging Trends and Technologies
- Ensuring Data Validation
- Case Studies and Examples
- Conclusion

Historical Context of Spatial Data

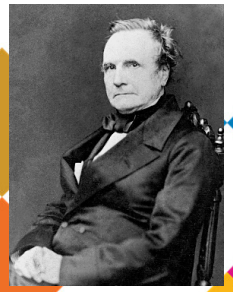
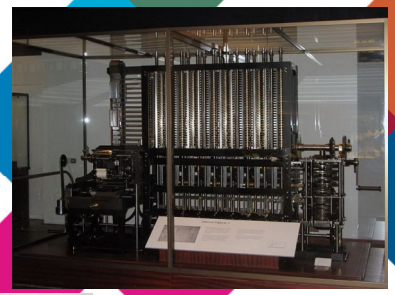
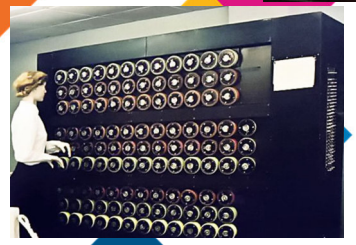
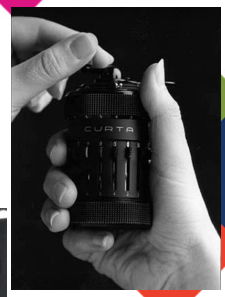
Evolution of spatial data: past to present

Key milestones and developments

Quick history of Computers

Source – Wikipedia - *https://en.wikipedia.org/wiki/History_of_computing_hardware*

- The first computer was invented by Charles Babbage (1822) but was not built until 1991!
- Alan Turing is often considered the father of modern computer science. He helped develop the "Bombe" in 1941. Built to decode the German Enigma encryption machines.
- After the war, Curt Herzstark's Curta made history as the smallest all-mechanical, four-function calculator ever built.
- The ENIAC (1945) was the first electronic general-purpose digital computer; it filled a room.
- The Micral N was the world's first "personal computer"(1973).
- IBM developed the Special Computer APL Machine Portable (SCAMP) prototype in same year.

Key Milestones and Developments

1959 – Douglas T. Ross coined the term *computer-aided design* (CAD) in 1959

1963 – Roger Tomlinson started development of geographic information systems in Canada

1969 - Jack and Laura Dangermond established the Environmental Systems Research Institute (ESRI)

1969 - Jim Meadlock founded Integraph

1969 - Laser scanner was born in Cambridge England (Laser Scan- 1Spatial)

1978 – ERDAS Established

1982 – AutoCAD founded

1985 - GPS becomes an operational system

1986 - Establishment of MapInfo

1988 - Small World was founded

1989- Merging of networks to form the Internet

1993 – Safe Software founded

1994 - OGC formation (David Schell, Ken Gardells, Kurt Buehler, et al)

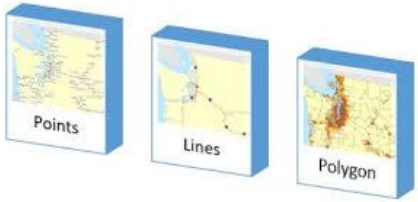
Current State of Spatial Data

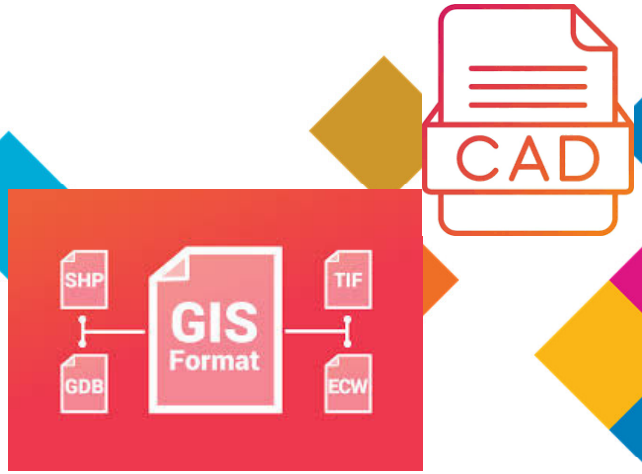
Data standards, formats, and structures

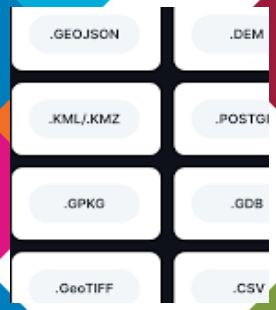
Governance and regulatory frameworks

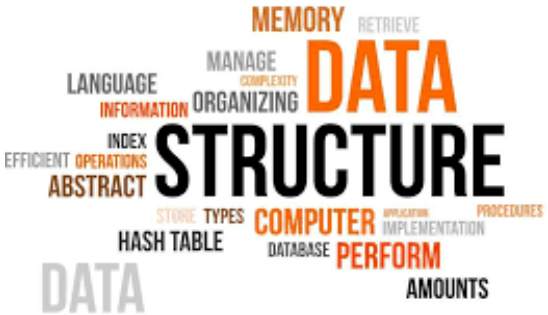
Data standards, formats, and structures

Open Geospatial Consortium









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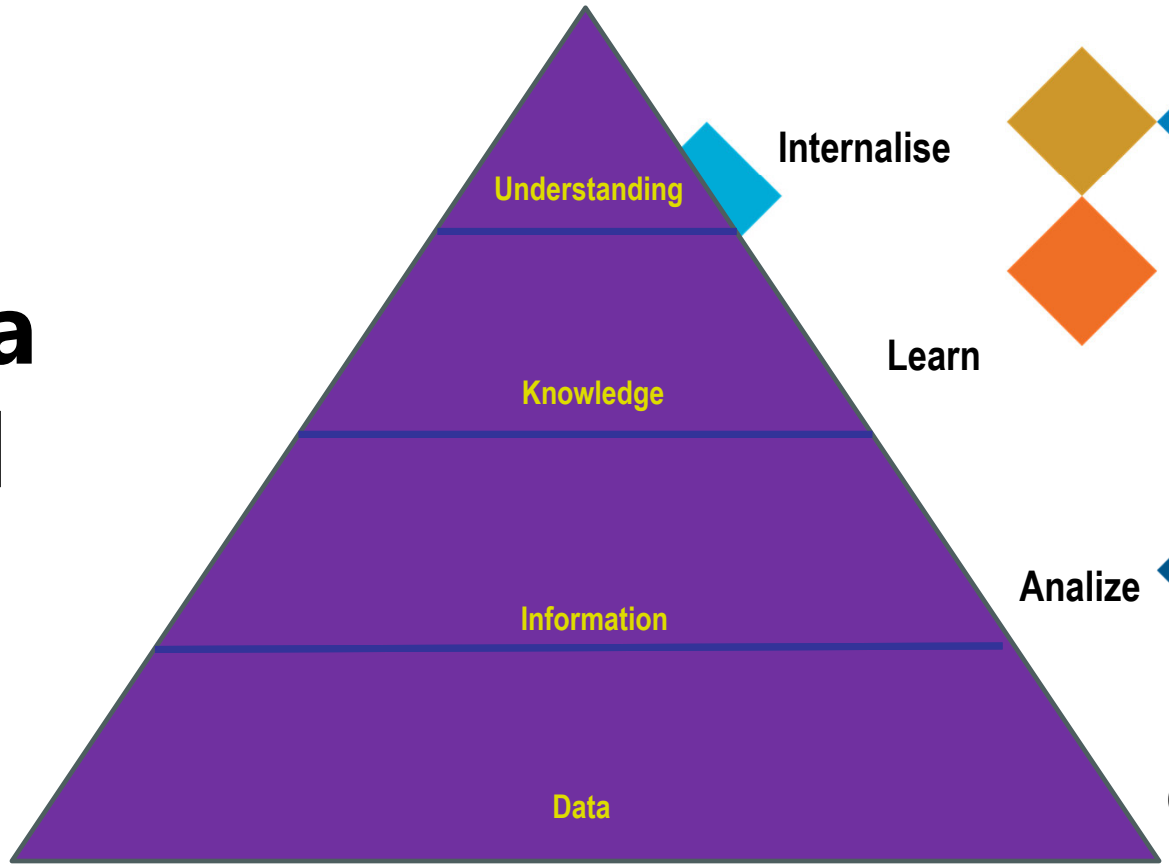
The Data Pyramid

Hal Varian – Google chief Economist



Internalise

Learn

Analize

Collect

Emerging Trends and Technologies

Influence of AI and machine learning on spatial data

Advances in data collection and processing

Alan Turing's AI definition and Test

Turing is considered a founding father of artificial intelligence (AI) and modern computer science

Turing Test - A benchmark for determining whether a machine can exhibit intelligent behavior indistinguishable from that of a human. The test involves a human interrogator interacting with both a human and a machine, with the goal of the interrogator correctly identifying which is the machine

https://www.britannica.com/science/history-of-artificial-intelligence

AI and the Spatial Industry

https://www.esri.com/en-us/capabilities/geoai/overview#:~:text=It%20helps%20the%20oil%20and,%2Dconsuming%20on%2Dsite%20inspection.

Geospatial Artificial Intelligence – GeoAI

Used in

State and local government

Natural resources

National mapping and statistics

Defence and intelligence

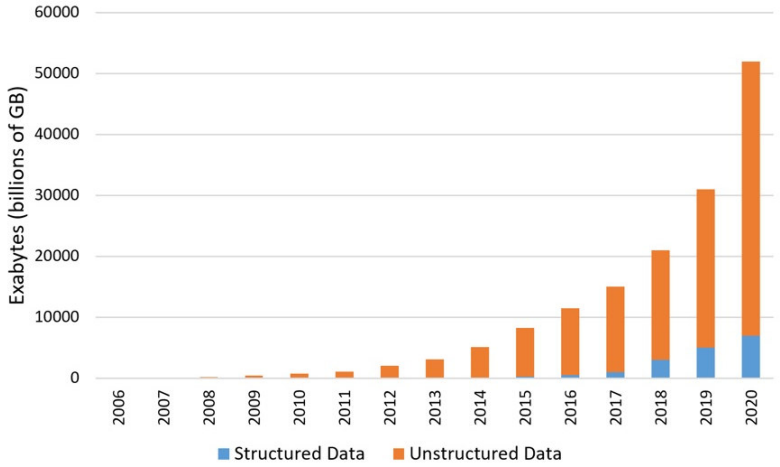
Public safety

Insurance

AEC

Business

Data Growth



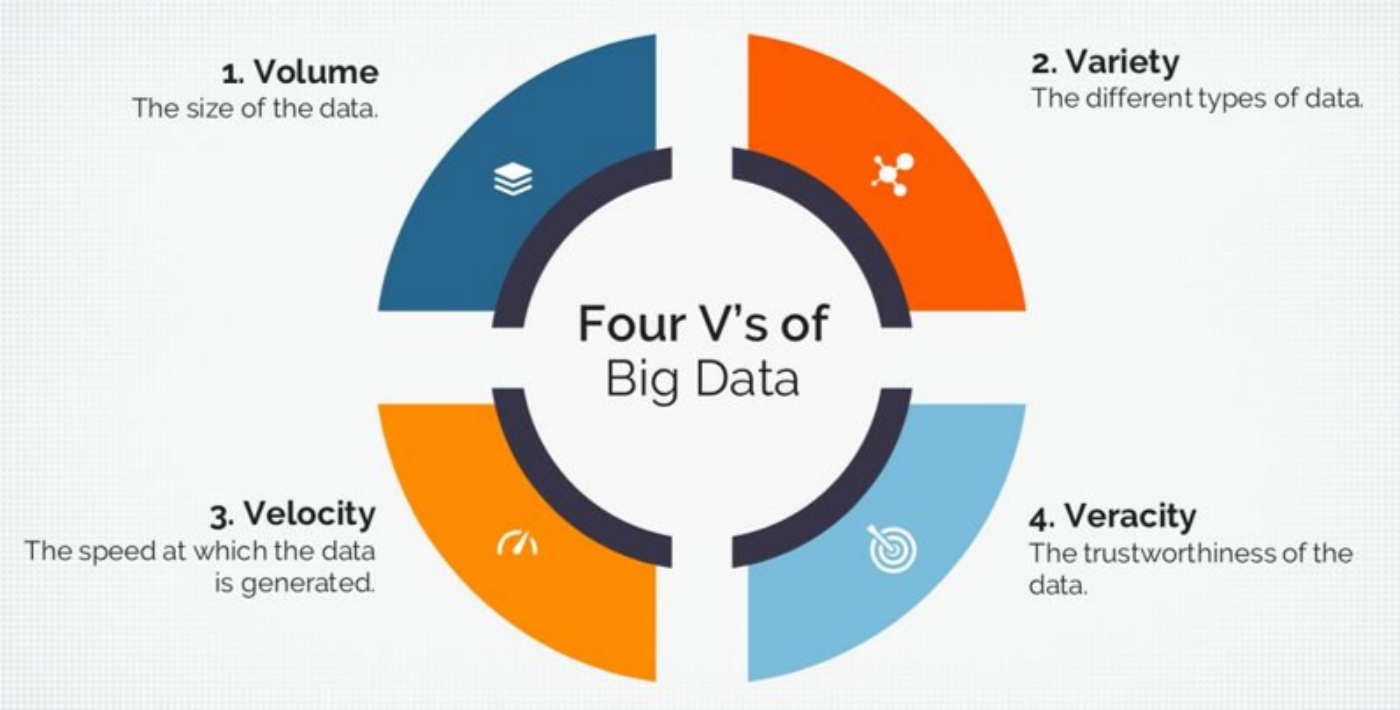
Between the dawn of civilization and 2003, we only created five exabytes; now we're creating that amount every two days.

- Hal Varian, Chief Economist, Google

global data creation is projected to surge, reaching 394 zettabytes by 2028 - IDC

1ZB = 1 Billion TB

Four V's of Big Data



Ensuring Data Validation

Importance of data validation for spatial data

Methods and best practices for ensuring data accuracy

Consequences of neglecting data validation

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Case Studies and Examples

DEECA - Vector Data Platform (VDP)

UK - National Underground Asset Register (NUAR)

US - Google – Real Estate system

RealEstate Google

Leakage

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Conclusion

Everything happens somewhere

Spatial is fundamental to our society

CAD – BIM – Digital Twin – Digital Engineering - ?

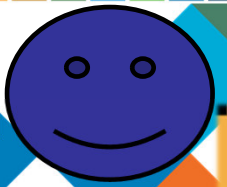
The Future of Spatial Data

- What's the future?
- Your guess is as good as mine ☺

The future is in "OUR" hands

The AI Nostradamus – ChatGPT predictions

1. Cure for Cancer for all mankind in the year 2031
2. The year 2050 may be a year plagued by natural disasters
3. 2060 humans might fall into fear and anxiety of the AI revolution
4. Man's first colony on Mars by 2074
5. 2084 may see the fusion of man and machine
6. 2085 a new pandemic
7. 2099 world peace



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Thank you for your time

Any Questions?