

# Session 1B: Future Geospatial Information Ecosystem

**UNWGIC, Hyderabad, India. 10-14<sup>th</sup> October 2022**

Moderated by Dr. Greg Scott, Inter-regional Advisor, UN-GGIM



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Global Geospatial Information Management

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# Session Outline

- **Welcome and opening remarks** – Dr. Greg Scott
- **Geospatial ecosystems and how they differ from SDI's** - Dr. Zaffar Sadiq Mohamed Ghouse
- **Drivers for change and technologies enabling change** - Ms. Ananya Narain
- **Bridging the digital divide with knowledge on-demand** - Dr. Lesley Arnold
- **Discussion – Are we moving in the right direction?**

Ms. Barbara Ryan, Ms. Meizyanne Hicks, Ms. Ingrid Vanden Berghe,  
Mr. David Henderson and Mr. Sanjay Kumar





# Bridging the digital divide with knowledge on-demand

**Dr. Lesley Arnold**

Director, Geospatial Frameworks  
Adjunct Associate Professor, Curtin University



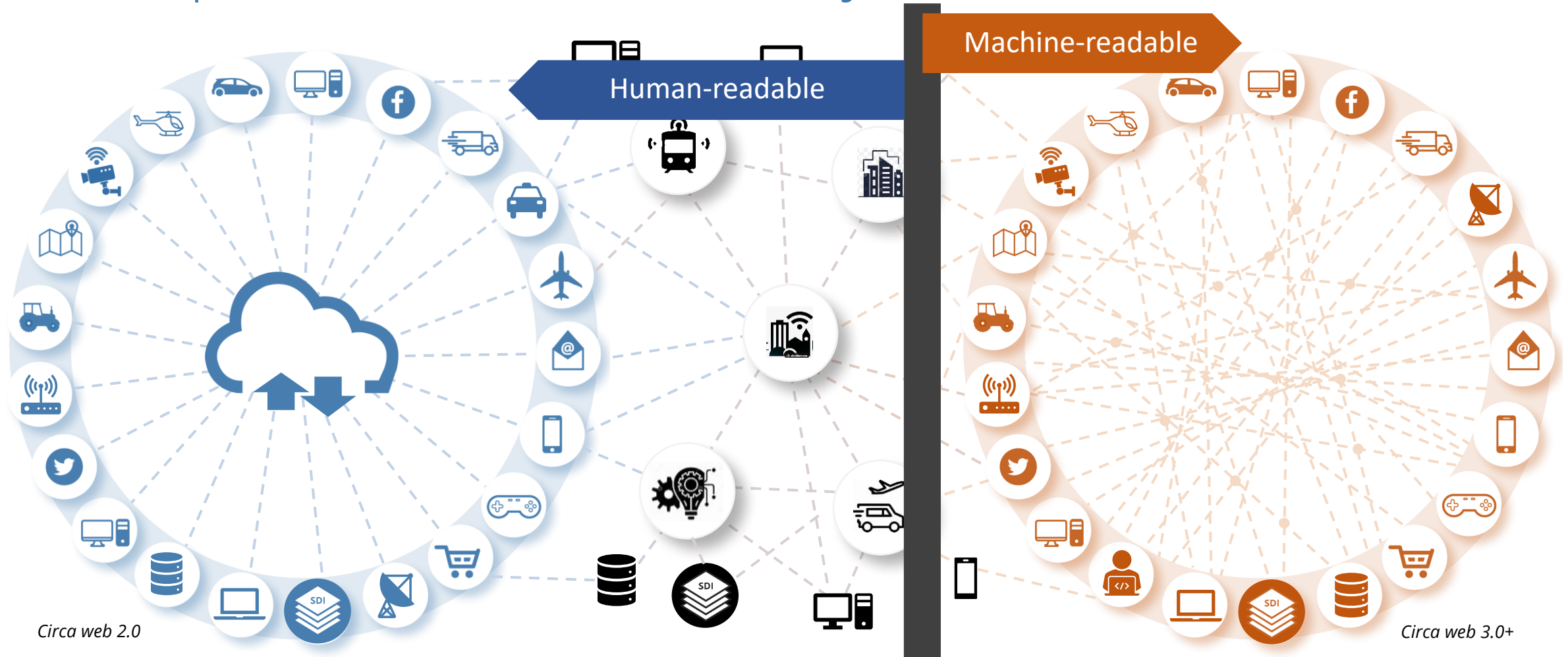
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# Geospatial Information Ecosystem



*Circa web 2.0*

*Circa web 3.0+*

## Spatial Data Infrastructures

Human centered – A person searches, retrieves, processes and analyses data via a web catalogue to obtain knowledge.

## System of Systems

Distributed/federated interconnected systems managed under the control of humans and include advanced machine analytics and AI

## The Web of Data

Machined centered – AI searches, retrieves, processes and analyses data to deliver knowledge direct to a person's device or another machine.

# On-demand Revolution

- Customer experiences happen in seconds
- Information and services are accessed via a digital mesh of applications layered on top of existing digital infrastructures and data ecosystems

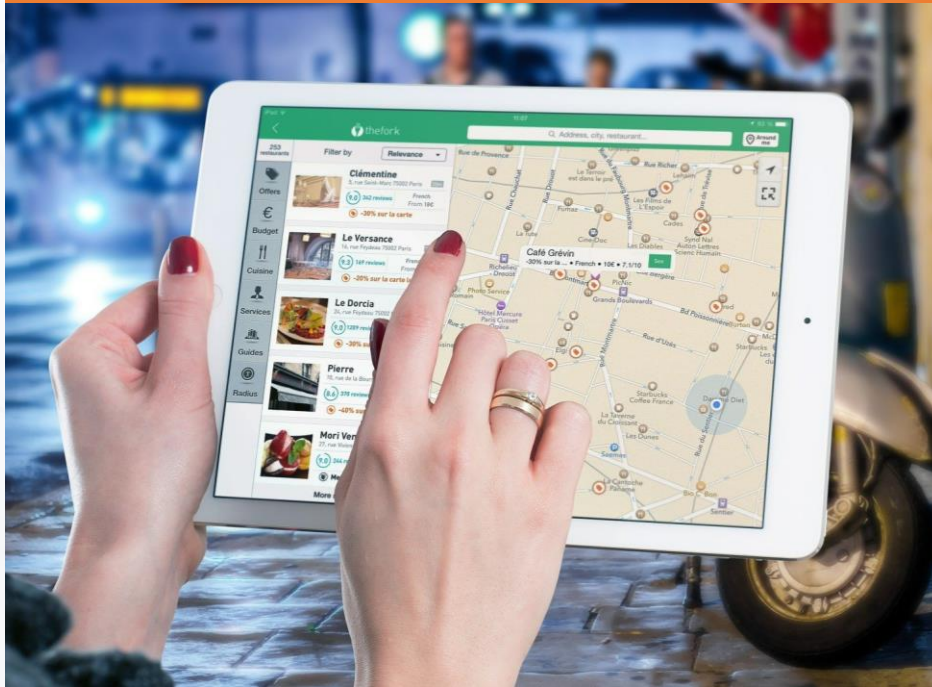




# Knowledge On-demand – two forms

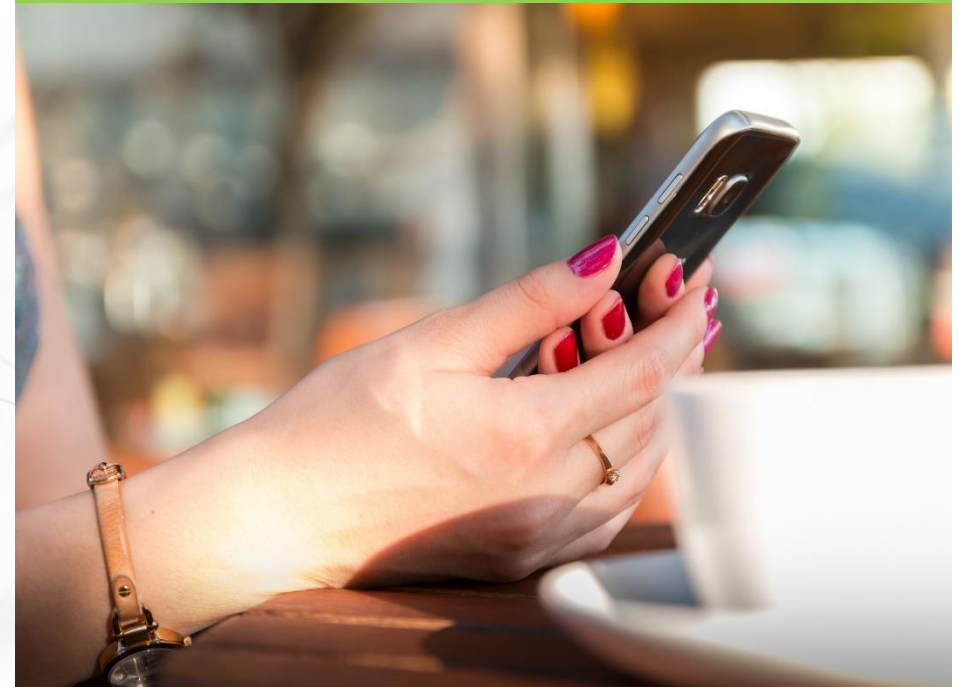
## Fixed-content Apps

Designed with known questions in mind



## Open Query Apps

Designed to answer the unexpected



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# Open Query Apps

## Good

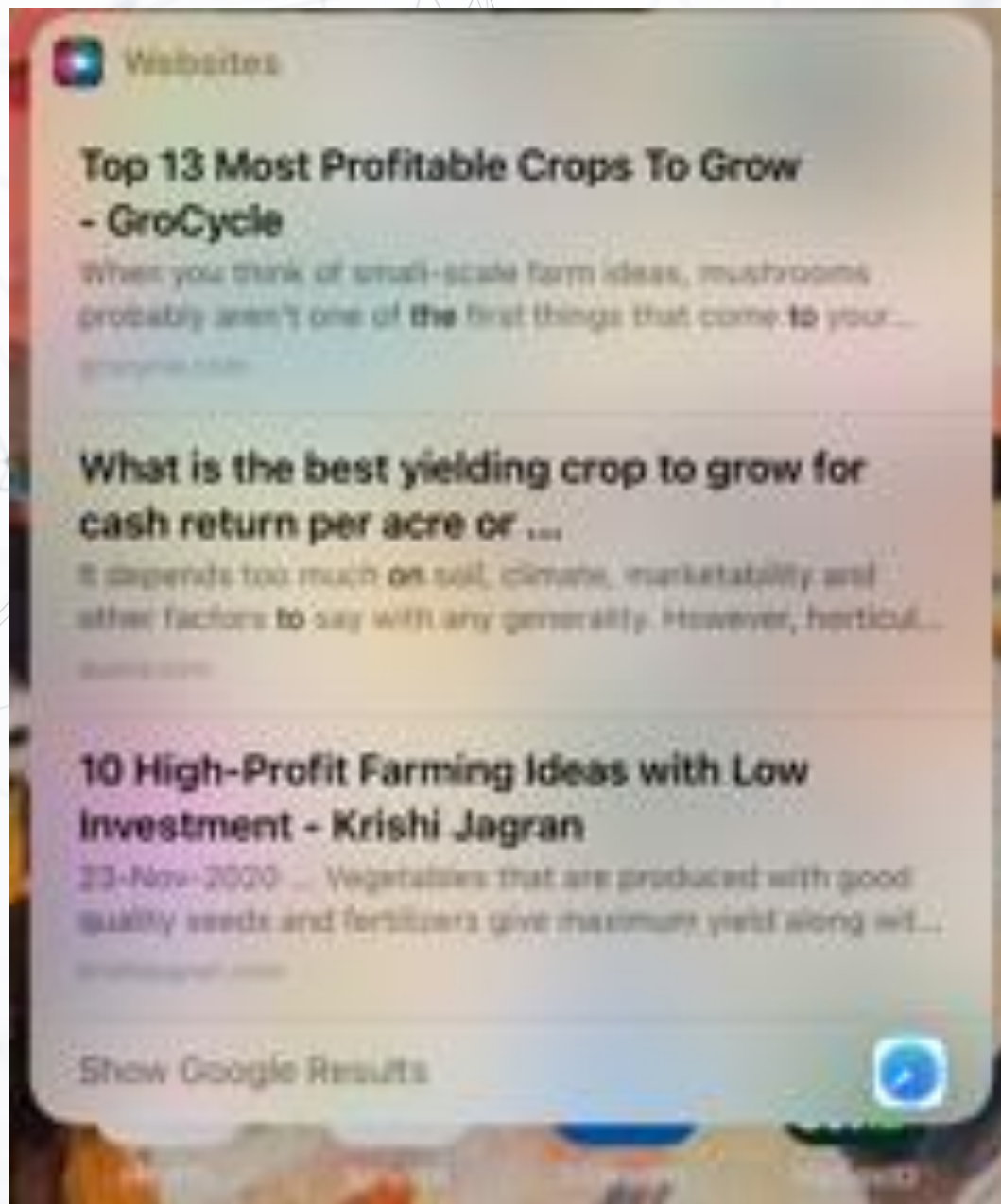
- Able to answer simple questions
- Cheap accessible infrastructure
- Global data available

## Bad

- Complex queries are not answered
- Algorithms do not take 'context' into consideration
- Data and analytics are not accessible to machines
- Data gaps impacting AI









# Teaching Machines to Think Geospatially



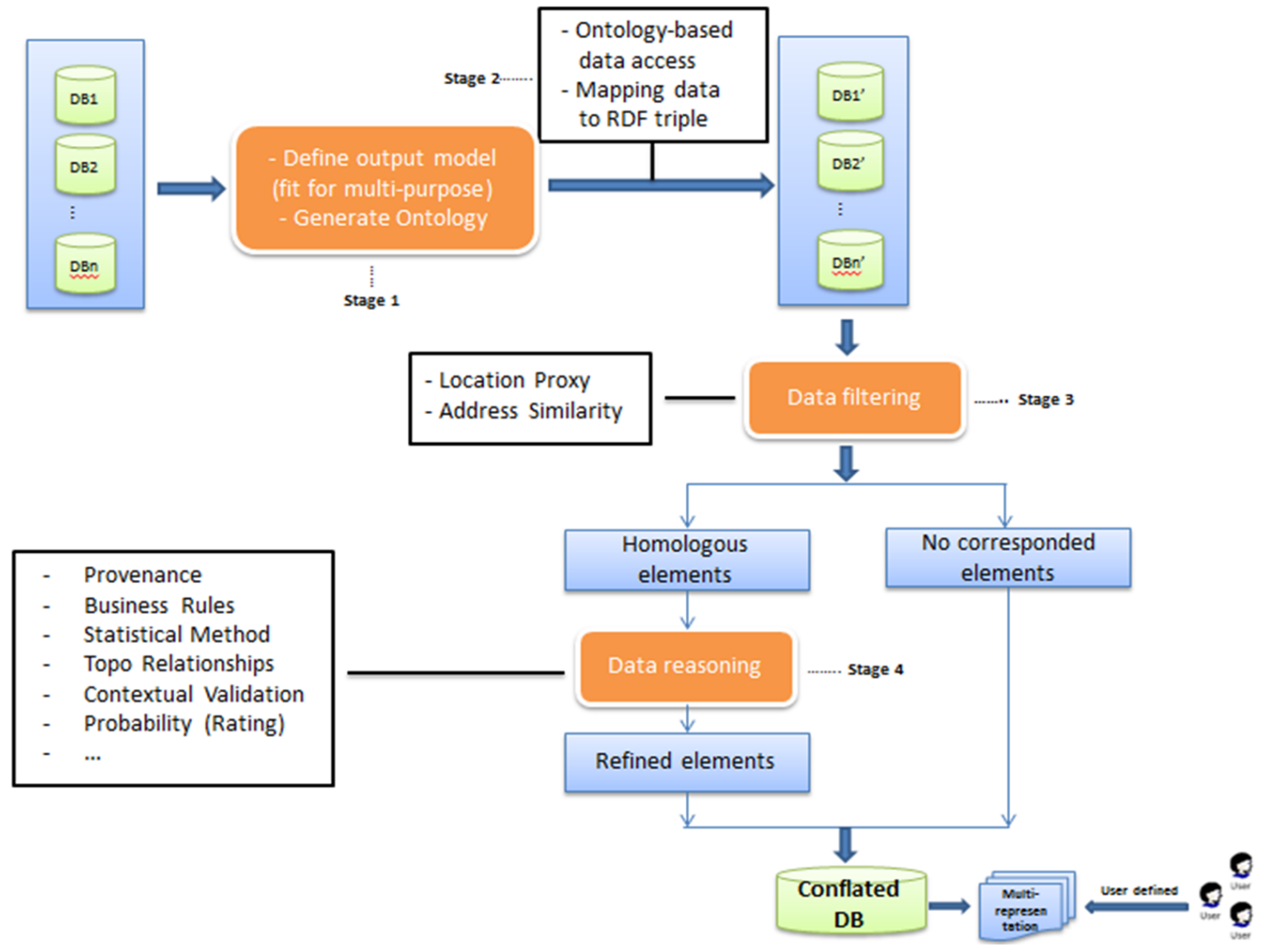
## Artificial Intelligence and Semantic Web Technologies

Natural Language Processing, Spatial Filtering and Semantic Search, Domain and Process Ontologies, Data Vocabularies, SPARQL Queries, Resource Description Framework etc.



# One process at a time

- Dealing with duplicate data on the fly
- Data Conflation
- Human logic in design



# Focus on Knowledge not Data

No one should be left behind

## 2D / 4D

**What** is the water quality

**Where** is the water

**When** did the water have this quality

**Who** describes the quality

**Whose** responsible for water

## Operators

Boolean

Proximity Logic

Topology

Map Algebra

## 3D / 4D

**Why** did the water quality arrive at this state

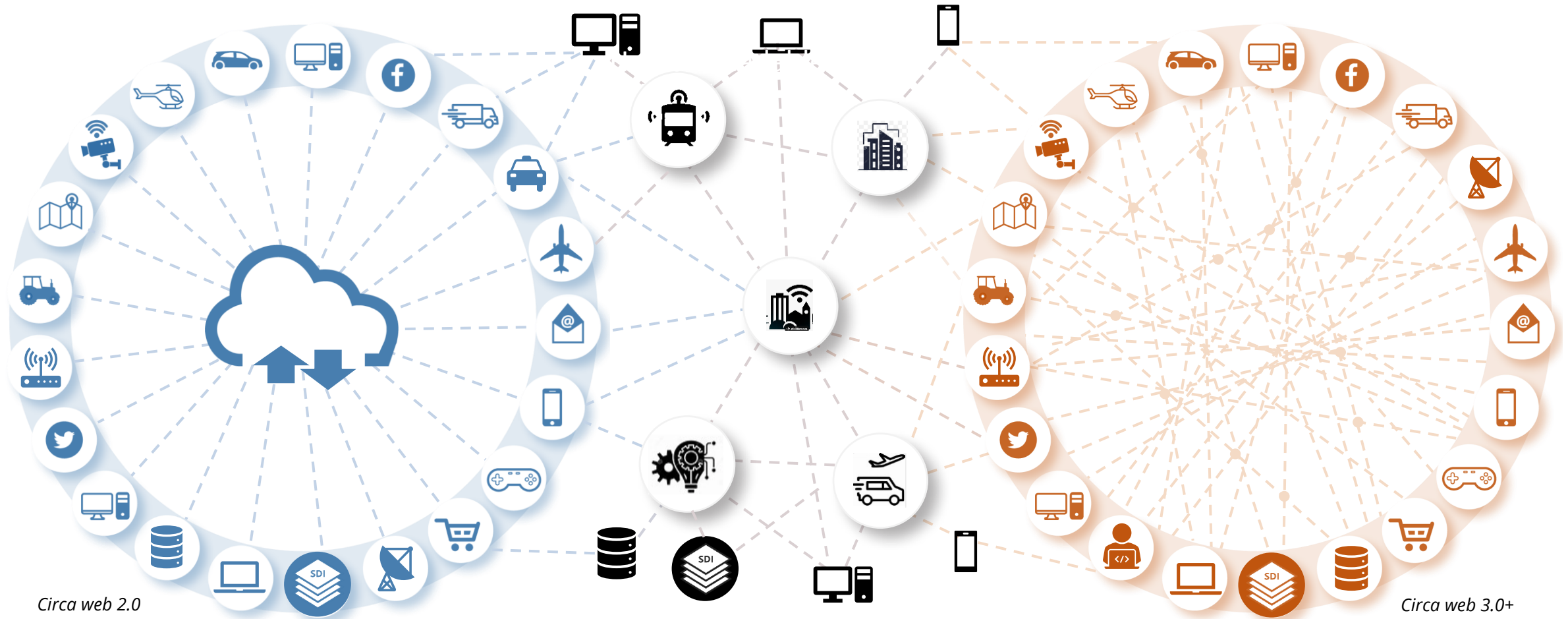
**How** do we change the water quality

**Which** is the best method





# Geospatial Information Ecosystem

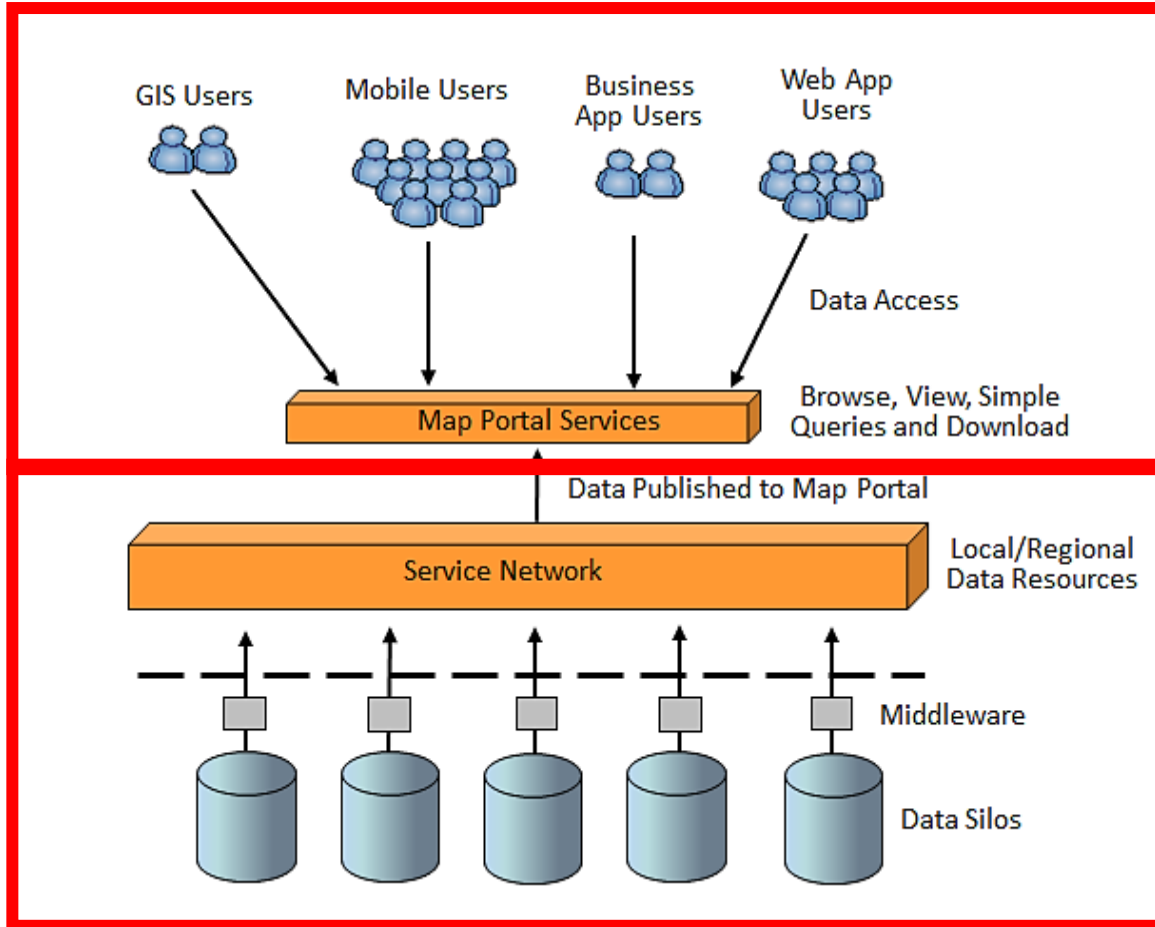


**Spatial Data Infrastructures**  
Human centered – A person searches, retrieves, processes and analyses data via a web catalogue to obtain knowledge.

**System of Systems**  
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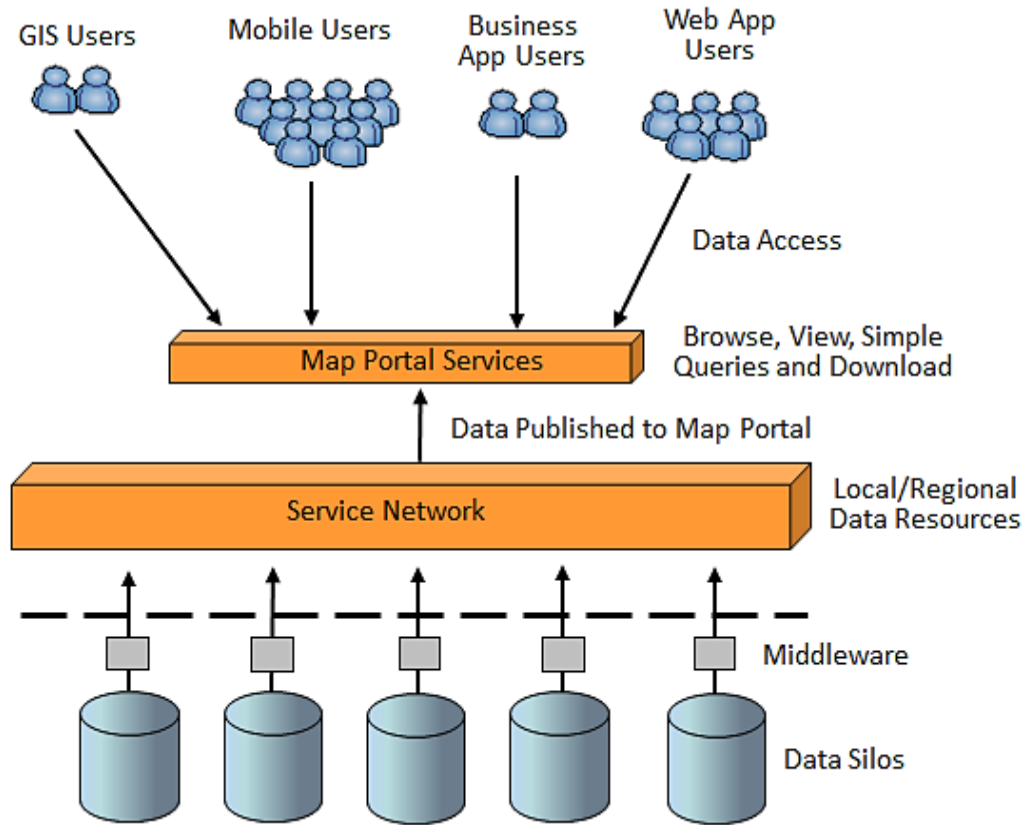
**The Web of Data**  
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# Spatial Data Infrastructure

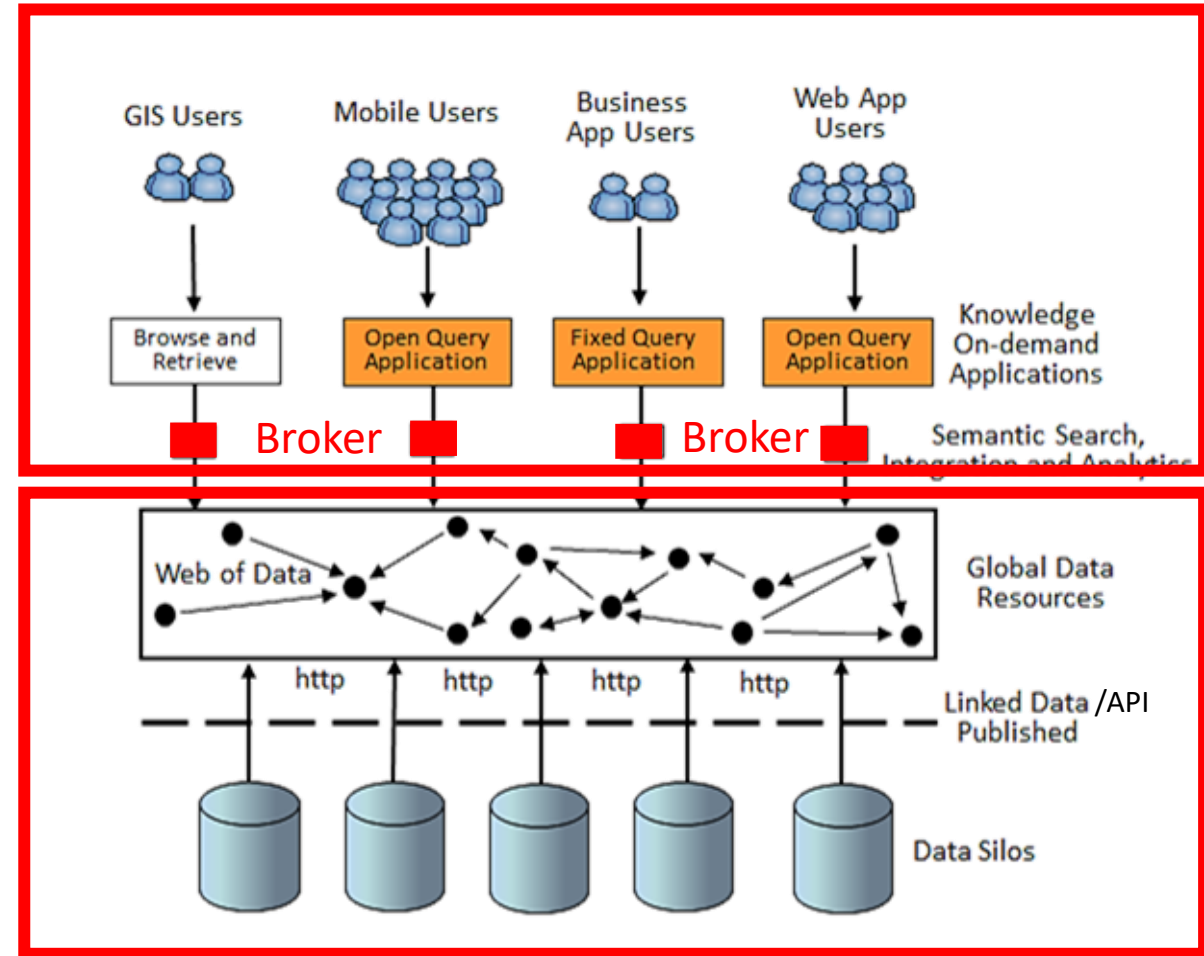


Human-accessible Data

# Spatial Data Infrastructure



Human-accessible Data



Machine-accessible Data



# Web of Data

(Global Digital Ecosystem)

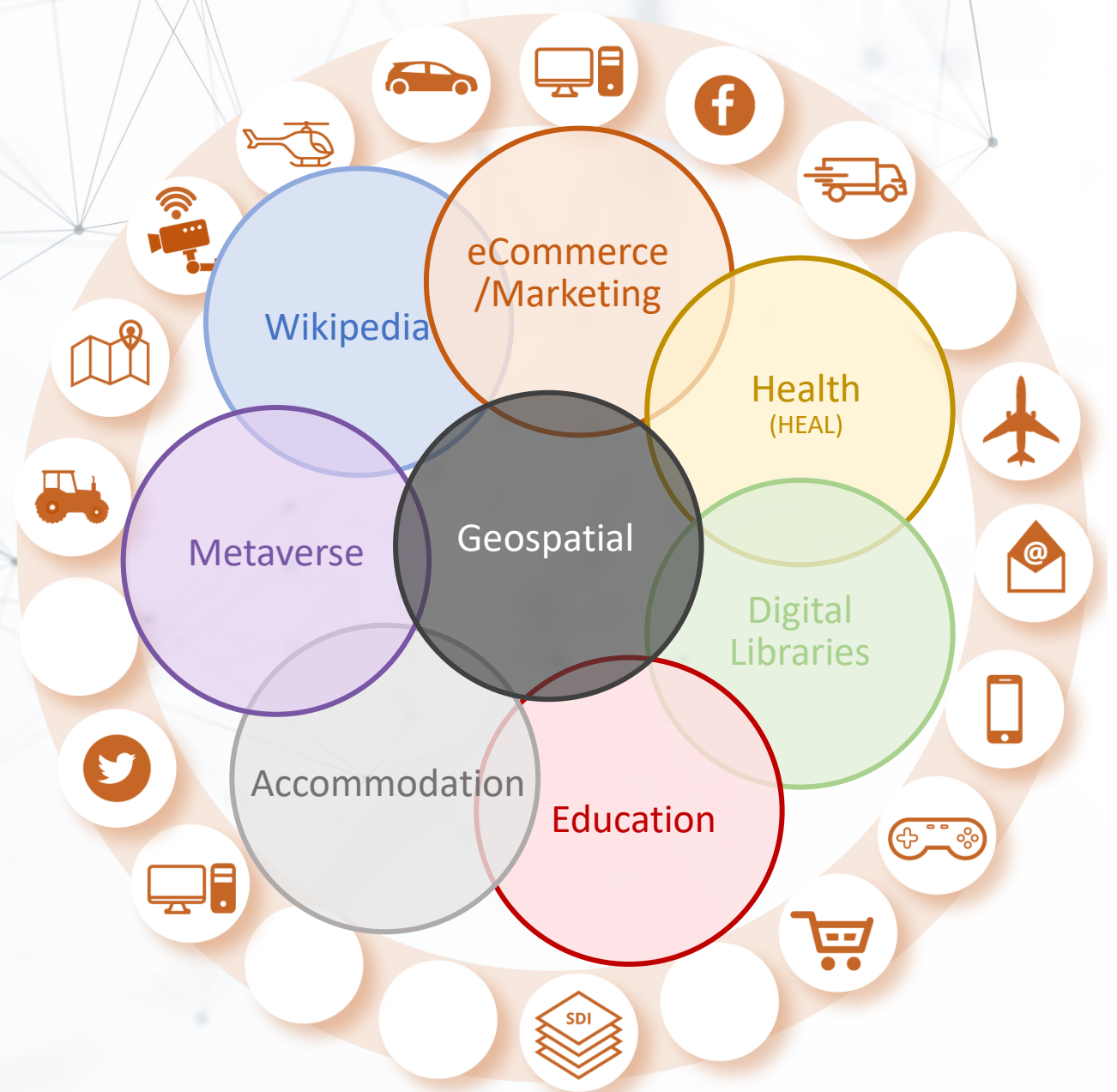
Open Query Apps operate within the Web of Data

The Web of Data is made up of many ecosystems

Geospatial is a 'key' integrator – of this digital fabric.

Cross-sector and cross-discipline

It ties together suppliers, users and service providers in real-time



# The Geospatial Metaverse – Infrastructure, Tradecraft and Applications




### GeoCubes Universe

Explore the Real World with your mobile phone or through geolocated positions and discover Gates to multiple VRE (Virtual Reality Experiences), three-dimensional spaces owned by users, where you can live or show different realities.

## Browsing the Geo Web Metaverse: Weekly Update #21

March 23, 2021

### What is geo metaverse?

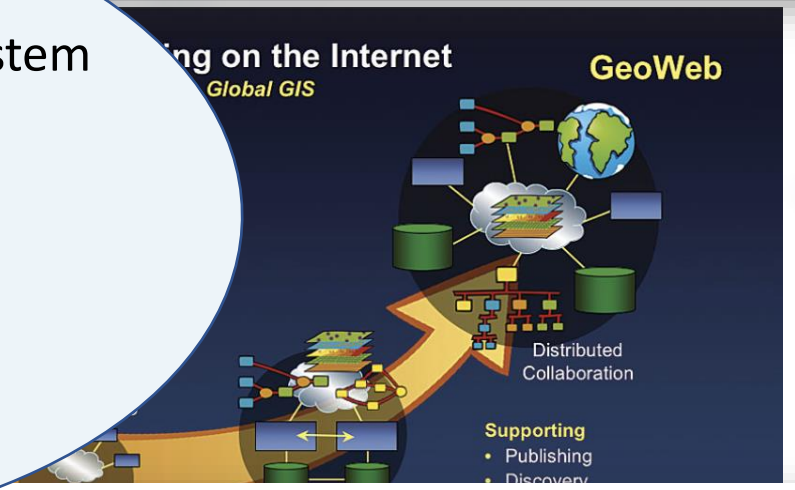


**GEO METAVERSE** is a mobile app. It uses a geo reality user interface on your mobile device. It does not require any additional hardware.

Geospatial Metaverse  
 Semantic Web – Geo System  
 GeoWeb  
 Geo-semantic Web  
 GeoCubes Universe  
 GeoKnow  
 The Geospatial Web  
 Geosocial Universe

### A Semantic Web- Geo System

November 2008  
 Conference: 3rd International Conference On Advanced Computing & Communication Technologies · At: ASIA PACIFIC INSTITUTE OF INFORMATION TECHNOLOGY [First International College Approved by AICTE, MHRD, Government of India and Department of Govt. of Haryana]



### Chapter 13: Geo-Semantic Web

By: Peter L. Pulsifer & Glenn Brauen  
 In: [Understanding Spatial Media](#)  
 Chapter DOI: <https://dx.doi.org/10.4135/9781526425850.n13>  
 Subject: [Communication and Media Studies](#), [Geography](#), [Engineering](#)  
 Keywords: [interoperability](#); [ontologies](#); [semantic web](#)

## Geolocal AR: The Metavearth Materializes





# Why Geoverse?

- Geoverse is NOT a new name for SDI and NSDI – all coexist in the future information ecosystem
- Geoverse is not a business name; it is a dictionary meaning
- Need a brand to attract new workforce and start conversations, and for all to get behind the ‘change journey’
- Geoverse leverages the metaverse brand, but is more than the metaverse
  - Integrate geospatial information – 2D to 4D
  - Predictive analytics
  - Integrated data from a wide-range of disciplines – no finite boundary
  - Delivery of real-time knowledge in all its forms
- A name must endure the journey - Geoverse will not happen overnight





# Discussion - Are we moving in the right direction?

Moderator **Dr. Greg Scott** Inter-regional Advisor, UN-GGIM, United Nations

Panellists

**Ms. Barbara Ryan**, Executive Director, World Geospatial Industry Council

**Ms. Meizyanne Hicks**, Director Geospatial Information Division, L&S Dept, Fiji

**Ms. Ingrid Vanden Berghe**, Administrator General, National Geographic Institute, Belgium, Co-Chair, UN-GGIM

**Mr. David Henderson**, Chief Geospatial Officer, Ordnance Survey, UK

**Mr. Sanjay Kumar**, CEO, Geospatial World



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