Special Session 1B, Hall 5,6
The Future Geospatial Information Ecosystem
2nd United Nations World Geospatial Information Congress
Wednesday 12 October 2022

Geospatial Ecosystems - how they differ from SDI's

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New and emerging condition	Impact on SDIs
Location in decision-making will be commonplace	– The catalogue and portal approach is not sufficient for decision-making by a wider and more diverse user and provider community.
New geospatial data sources and services	– The SDI concept is not suitable for the emerging collection of new producers of geospatial data and services. – Static metadata records and catalogues which relate mainly to historical data[9] are not suitable for many of the new data providers, data types, and applications. – Certain key data themes, such as Earth Observation (EO) imagery, are available from multiple commercial sources.
Technological advances	– SDIs driven by governments cannot keep up with today's technological advances or the massive amounts of location information being produced in real-time or near real-time. – SDIs focussed mostly on data availability; geo-analytics availability is now also very important. – IoT devices raise privacy concerns that were not present in 'traditional' SDIs. – Developing countries need SDI good practice examples that are based on modern technologies and practices.

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More automation, analytics, and intelligence	– The moral and legal issues arising are beyond the scope of SDIs, and even the geospatial community. – The way in which data is searched and accessed can be re-invented to be much more efficient and human friendly. – Increasingly machines are autonomously undertaking much geospatial data processing and applying increasingly sophisticated geo-analytics, leading to an increasing number of cases where algorithms make final action-orientated decisions. Traditional SDIs are not at all suitable for dealing with this major emerging reality. – Ad hoc analysis of real-time or near real-time data is fundamental for many automatization processes (e.g., in industry 4.0 applications). However 'real-time' has never been seriously addressed in traditional SDIs.
User expectations are changing	– The overwhelming bulk of users are not geospatial experts, and they expect much more than digital libraries (clearinghouses) provided by SDIs. A supply-driven SDI cannot provide the geospatial data and visualizations that they expect and increasingly demand.
Organisations are changing	– Organisational hierarchies, which were appropriate for national SDIs, will be replaced with more agile, multiparticipant team-based structures. – Organisations must cater for users outside the 'traditional' user base of geospatial experts.

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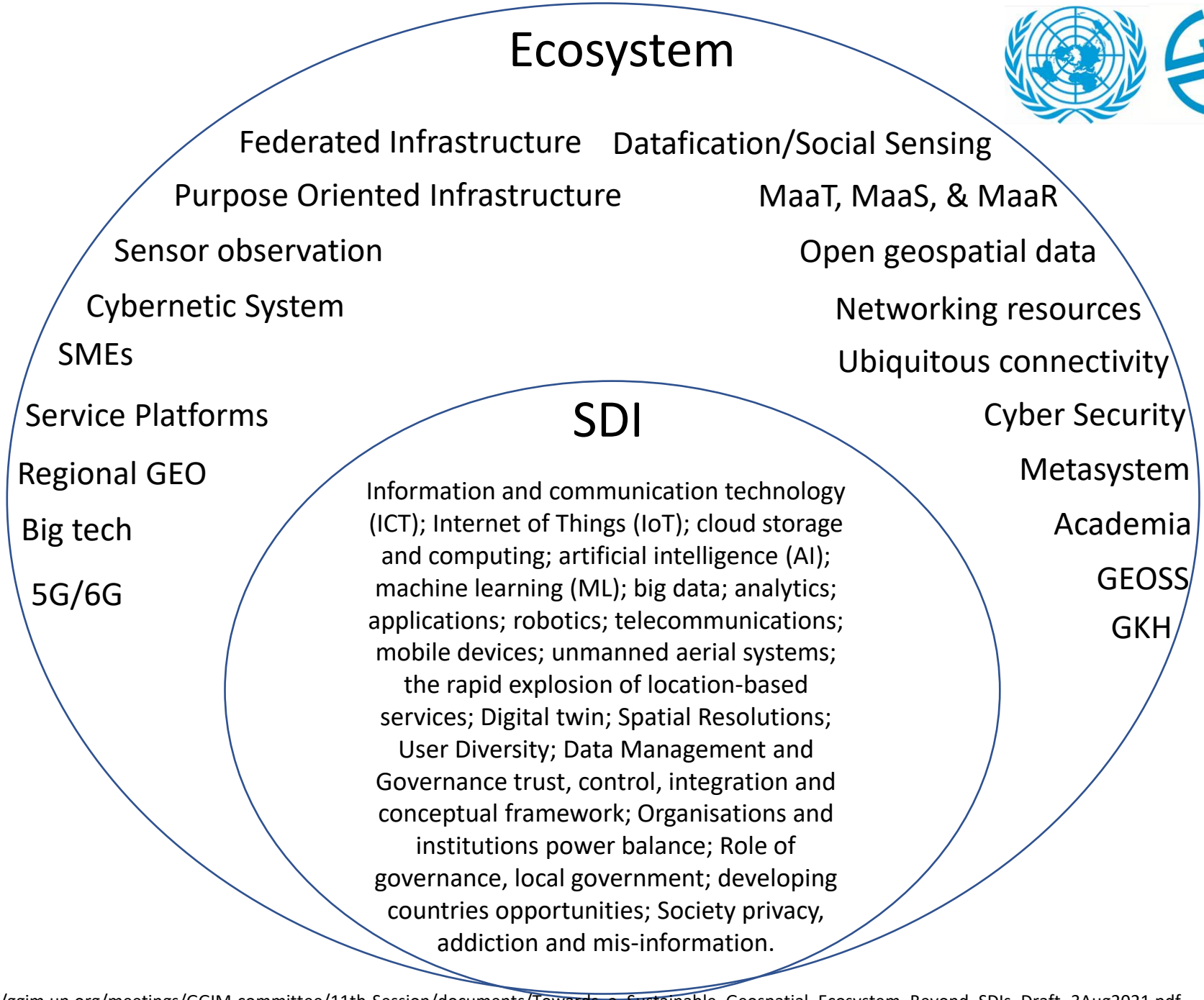

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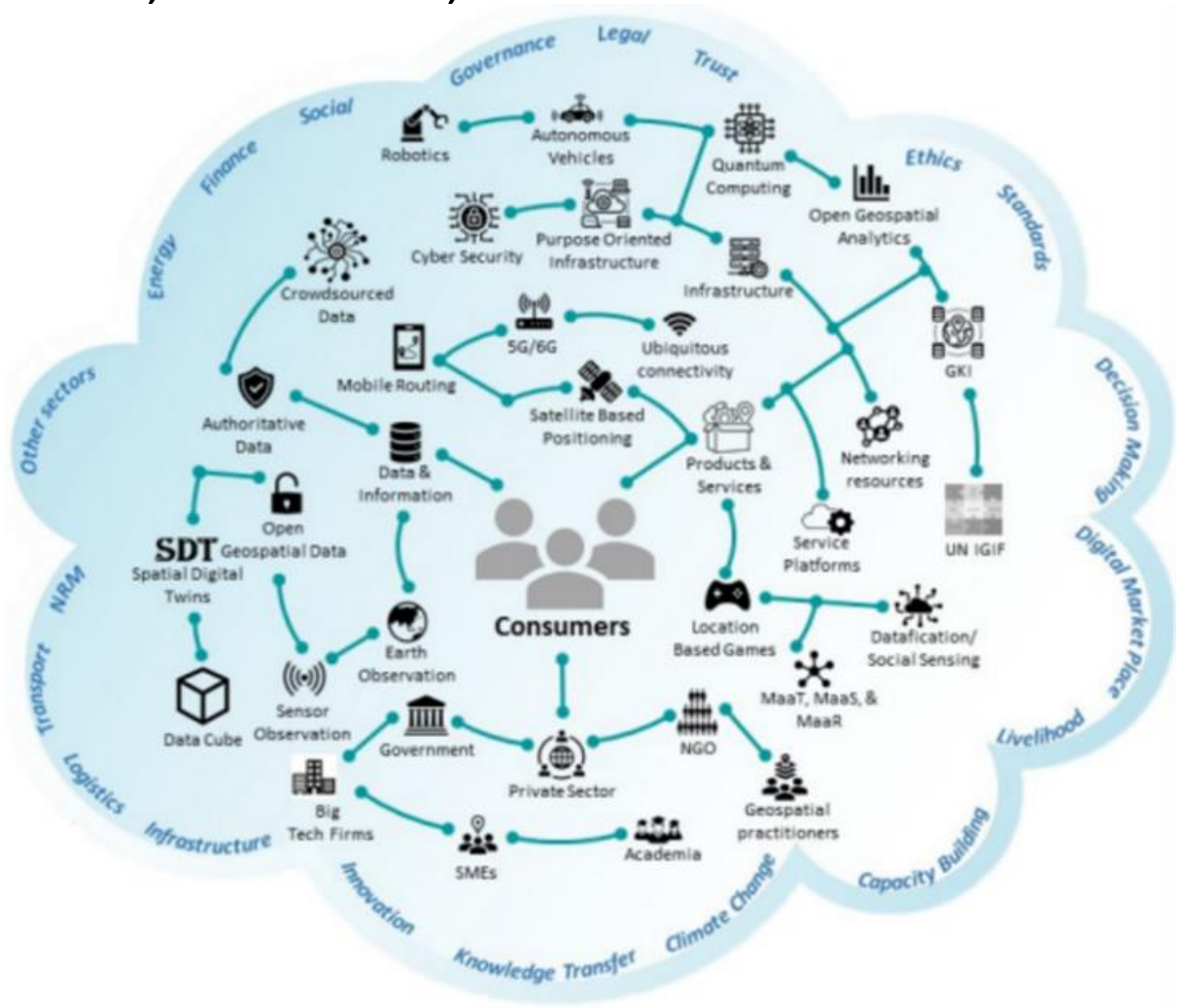
Geospatial ecosystems are logically subsets of wider digital information ecosystems, and typically comprise a multitude of stakeholders, not only government data providers and expert users as we typically have in a Spatial Data Infrastructure, but a much wider range of organizations, individuals, and machines.



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Geospatial ecosystems

- Drawing on knowledge about **natural ecosystems**, a geospatial ecosystem is defined as a system in which a **community of actors** (individuals or organizations and increasingly 'intelligent' machines) interact via the geospatial information and technologies in their environment.
- In a developed and mature geospatial ecosystem, **public good geospatial information can be accessed easily** (i.e. without the administrative barriers which may now exist).
- For example, someone requesting data on planning zones will not need to know which specific agency or agencies have jurisdiction over those data, and which protocols and data formats are necessary or available.
- Data regarding a wide range of other phenomena (such as forest fires, floods, immigration, and weather) will be similarly readily available.
- Similar to natural ecosystems, **a geospatial ecosystem is dynamic**: its balance may be disturbed at any time, and it continues to respond to past impacts and events.

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Geospatial ecosystems

- A geospatial ecosystem is coordinated and shaped by a **multitude of stakeholders**. It often self-organizes through both competition and collaboration.
- **Actors may form collaborations for specific purposes** and for their own benefit or profit or for some shared outcome. The duration of these collaborations may be short or long-term.
- The nature and abundance of communities of actors and the adaptive and dynamic networks which are created shape each geospatial ecosystem.
- A geospatial ecosystem provides a **variety of goods and services** upon which people depend. Ecosystem goods can be clearly 'tangible', such as the use of a single dataset or the **results from a sophisticated chain of geoprocessing events**, or more implied or indirect, such as the navigation of autonomous vehicles or location-based services.
- A **harmonized search of an ecosystem** may reveal potentially useful information available from multiple sources; some from the **government, some from perhaps an NGO or a university**. Other information may come from crowd-sourced datasets and others from interconnected "machines" or systems where no direct human intervention is required.

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