

The Global Biological Resource Centres' Network Architecture

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ICCC-12, 29 September 2010, Florianópolis, Santa Catarina, Brazil

Complexity of the Biological Data

Biosphere – The world we live in

Ecosystem – *The set of communities of all domains of life that interact with one another and the abiotic environment to form a unit*

Community – Interacting populations of organisms

Population – All individuals of a species or phylotype within a community

Organism – *A single individual*

Organ system – a specialized functional system of an organism

Organ – a set of tissues that function as a unit

Tissue – A set of interacting cells

Cell – the functional unit of all living organisms

Organelle – a specialized subunit within a cell

Molecule – *biochemical constituents of cells*



Data, information and knowledge

- Essential to predict and control the activities of biological systems
- We need dynamic integration of data, information and knowledge
 - on each component
 - on how components work together as systems

To address biocomplexity issues:

- Understand, measure, predict....
- Assemble virtual collaborations at different scales
- Integrate data, information, people ...
- Advanced e-infrastructures

Information is the fundamental currency of the new biology !

GBRCN Architecture

- Questions to be answered:
 - Who are the data providers?
 - Who are the data users?
 - What are their needs?
 - Outputs... local, national, regional, global....

National and Regional Networks

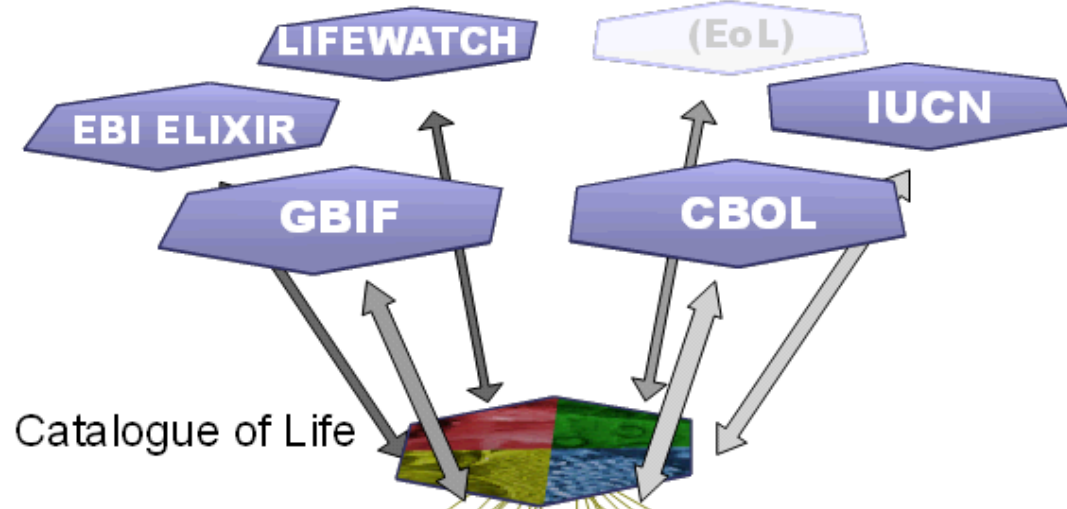
- Are key to promote local development
- Must be inclusive
- Must address the issue of data quality (known quality)
- Quality management and data sharing as an enabling process

Global systems

- Must build upon existing systems, so:
 - Must use/promote internationally accepted standards and protocols
 - Must be inclusive
 - Must know what are the questions to be able to provide answers (output)

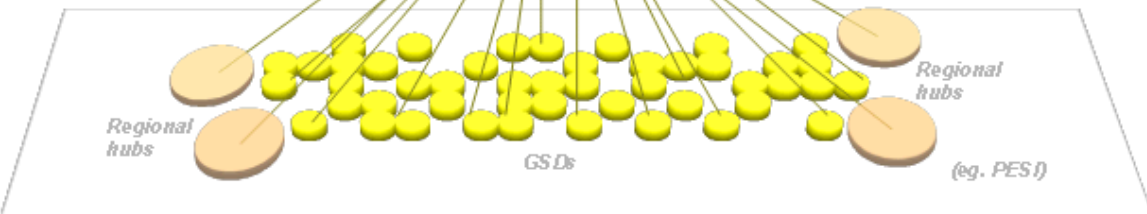


Global Biodiversity Programmes



Taxonomic

Databases



Nomenclators



i4Life

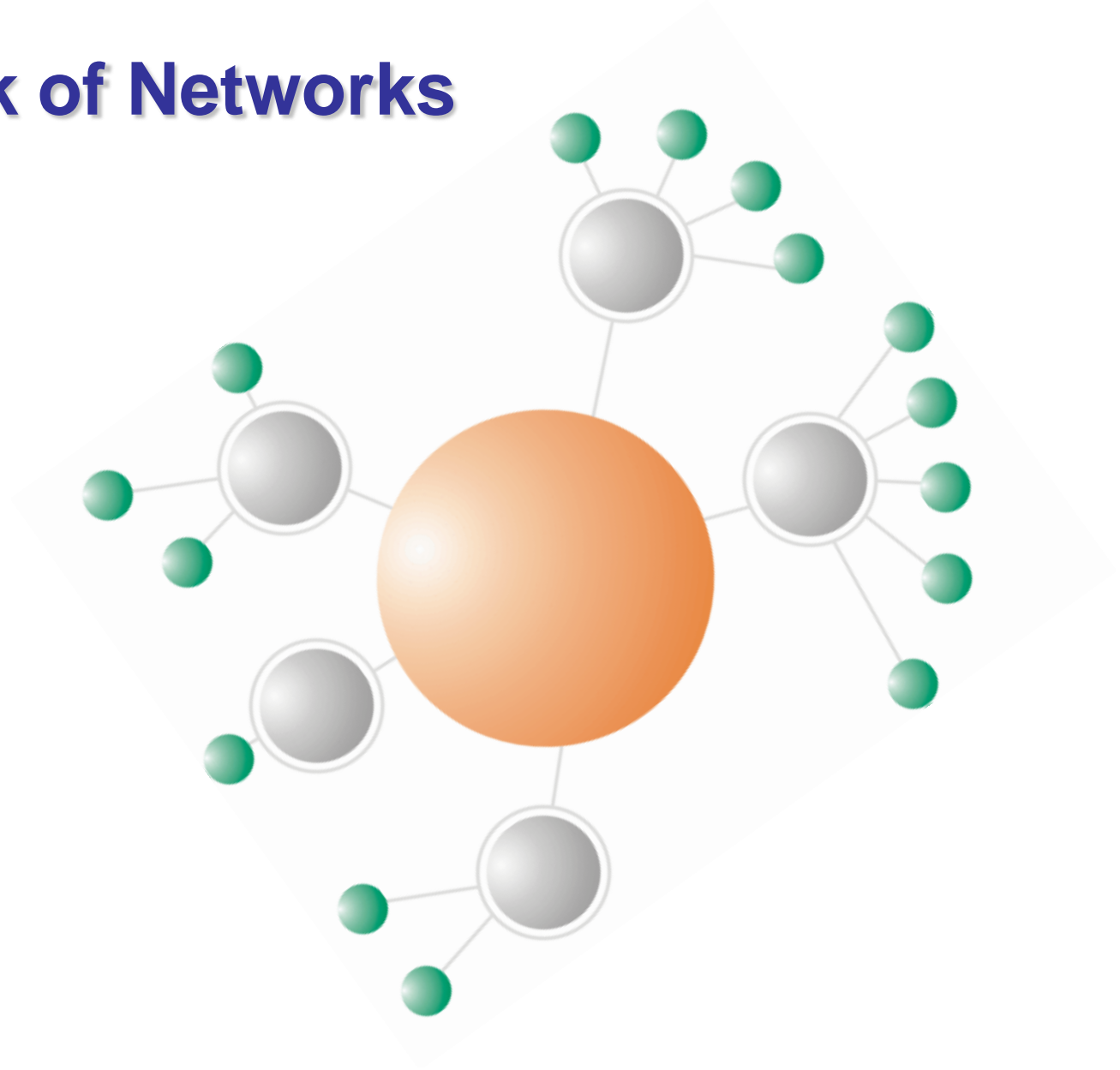
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4D4Life

GBRCN Architecture : key elements

- Interoperability
 - Standards and protocols (eg TDWG)
 - Build upon relevant initiatives (GBIF, CoL, EoL, ...)
- GBRCN focus (OECD best practice guidelines)
 - Quality management
 - Legal and safety issues
- Open, inclusive and scalable
 - As a true global network
- Coordination Mechanism (Secretariat)
- Global Open Access Infrastructure

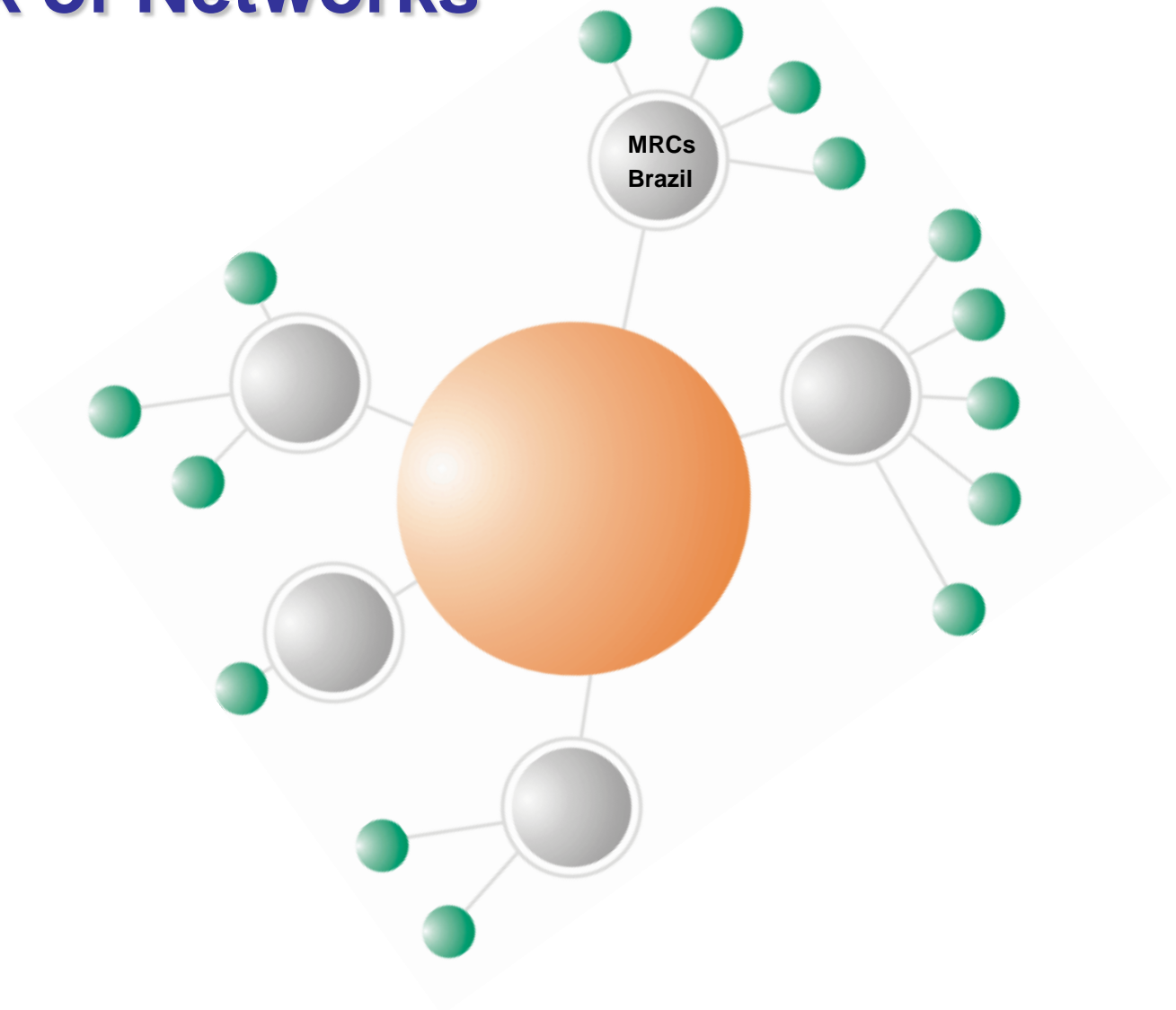
Network of Networks

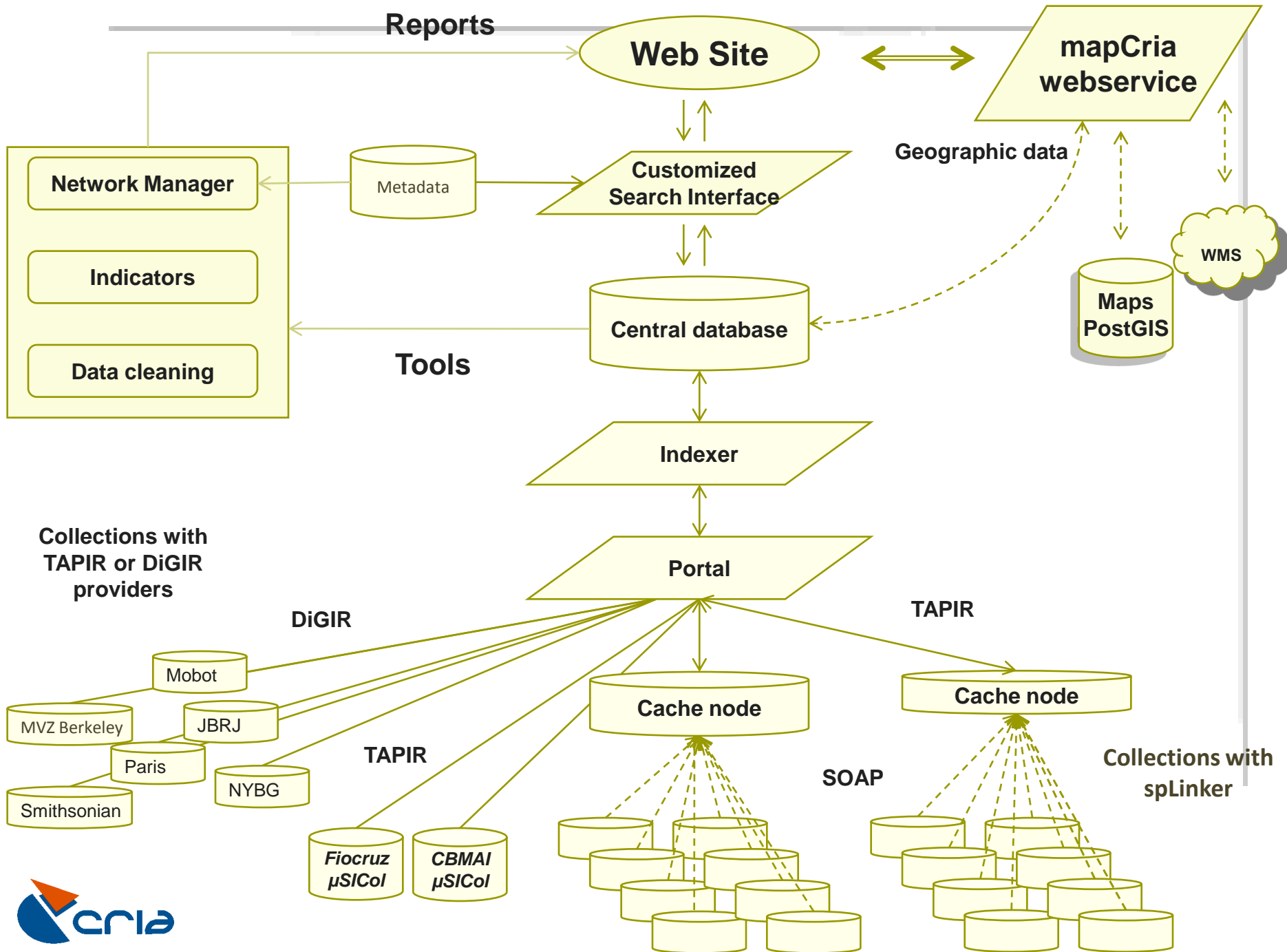


Architecture development

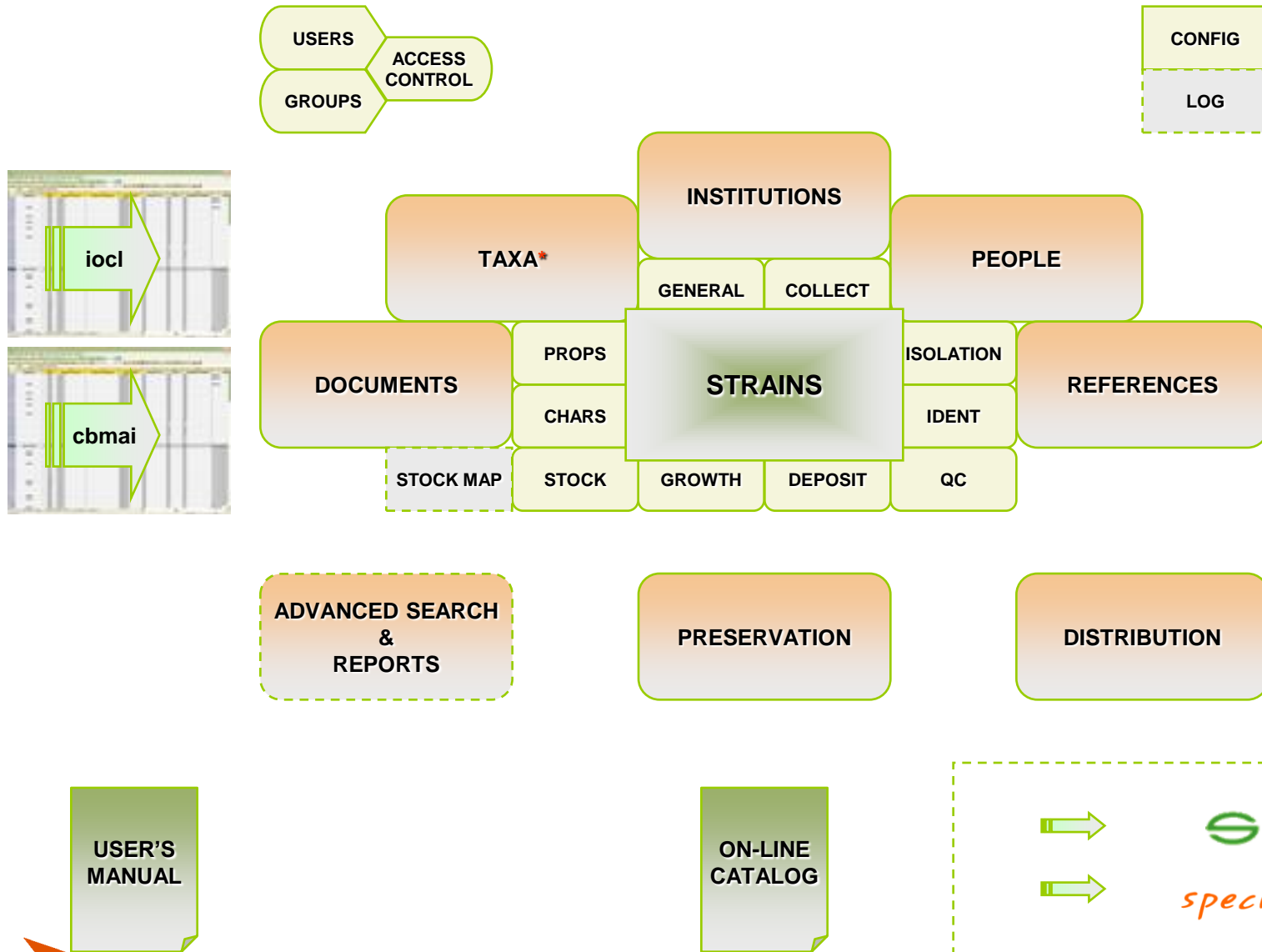
- Collection's databasing routine
 - Practically any software should be accepted (Excel, Access, PostgreSQL, MySQL, ...)
- Provider must have full control over the data served
 - What is sensitive data, what is open and free
 - Digitization strategy, data cleaning strategy
- Data providers must be fully acknowledged
- Connectivity problems must be addressed
- GBRCN must be interoperable with international initiatives

Network of Networks

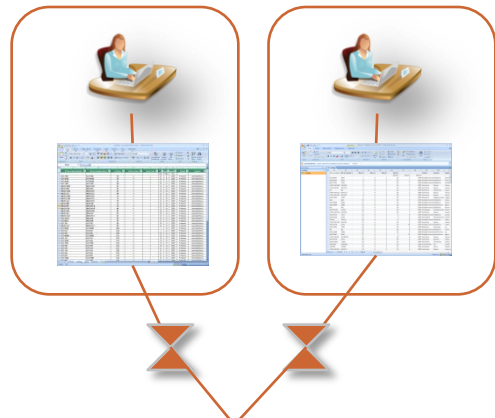
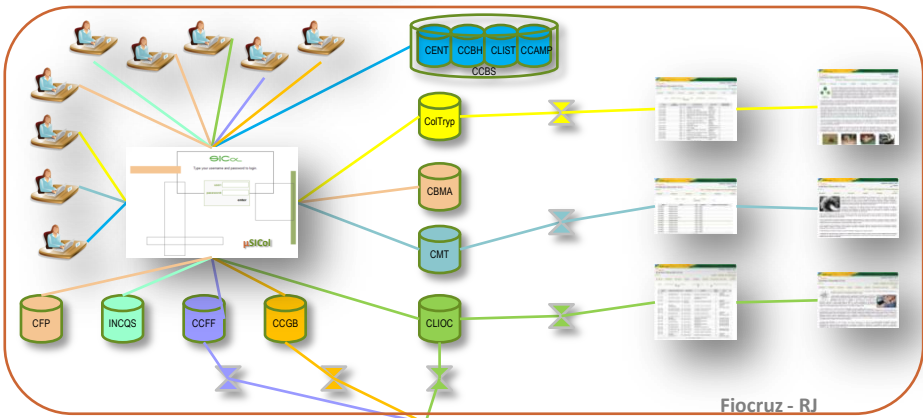
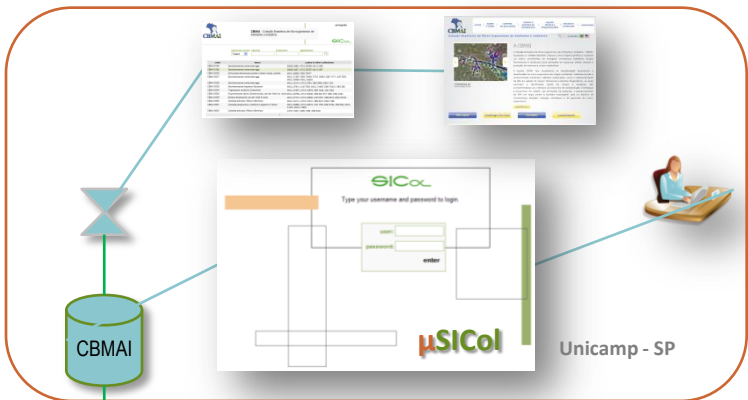




Collections' Data Management



Putting the pieces together....

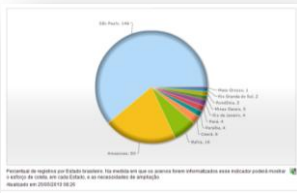


TAPIRLink

splinker

speciesLink (DarwinCore2)

SIColNet (DarwinCore2 + microbial)



ID	Organism	Accession	Country	Interpretation	Quality	Source
1000001	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000002	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000003	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000004	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000005	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000006	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000007	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000008	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000009	1011010101	1011010101	Neotoma	Neotoma	High	San Toms
1000010	1011010101	1011010101	Neotoma	Neotoma	High	San Toms

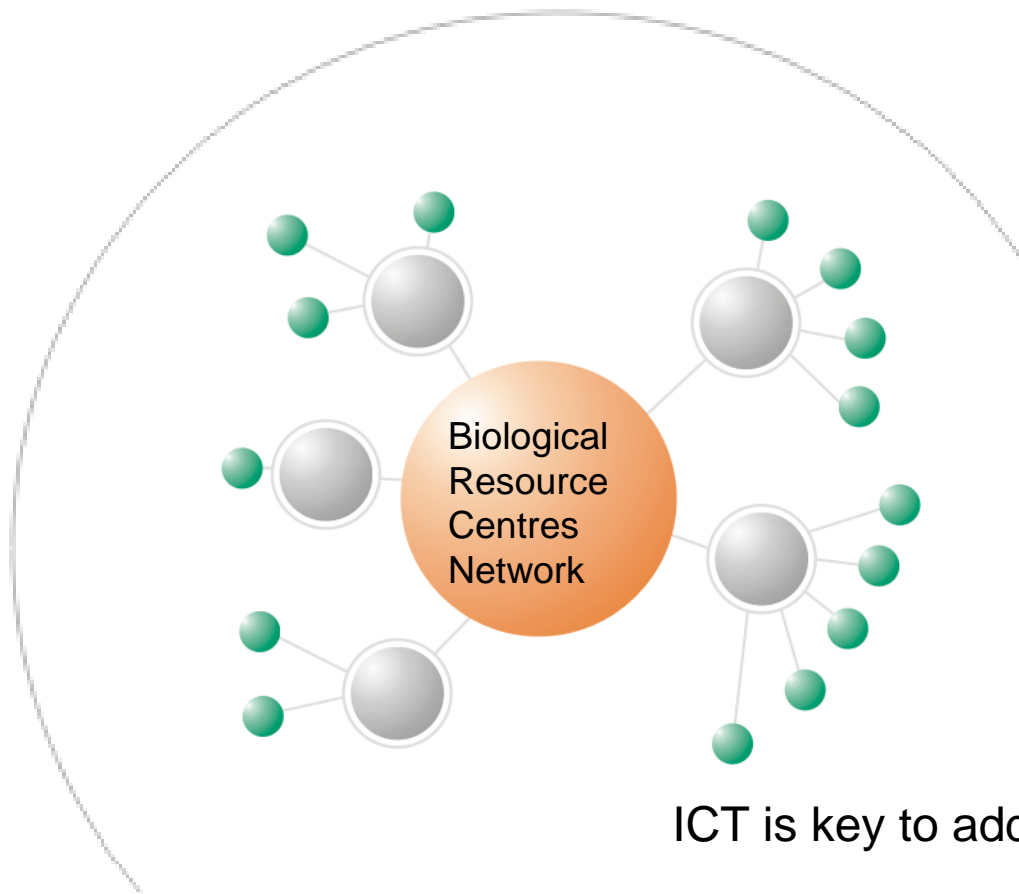


global catalogue

distribution maps

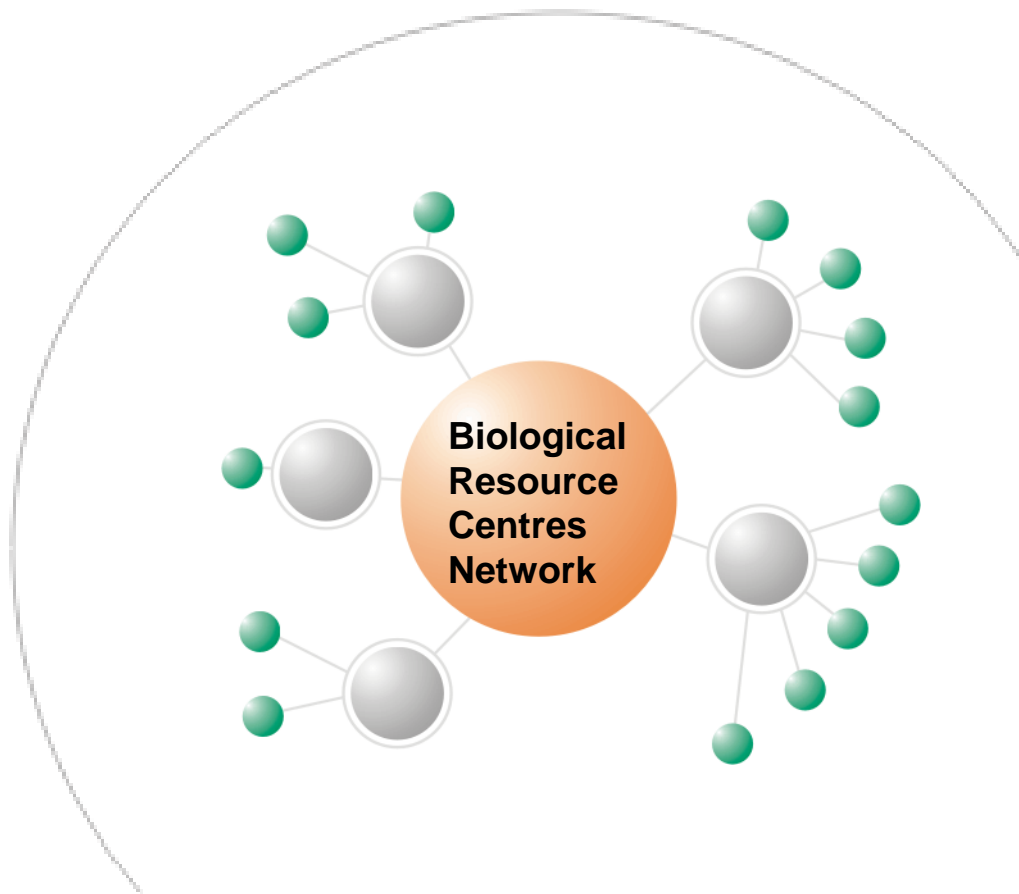
indicators reports

datacleaning reports



ICT is key to address GBRCN challenges !

Quality management
Traceability (processes and products)
Institutional coordination (public and private sectors)
Governance
Infrastructure development
Capacity building
International collaboration



OBRIGADO !

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