BEST PRACTICES FOR OCEAN SENSORS

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ROBEX WORKSHOP

VIENNA, APRIL 27 2017

Best

Practice

Accepte

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Lec

nity Practice

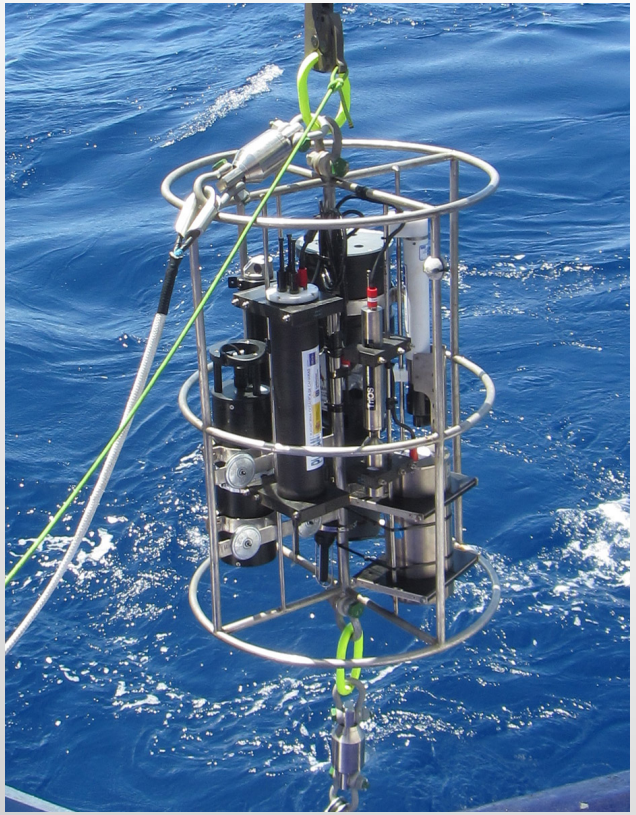
Not yet a standard

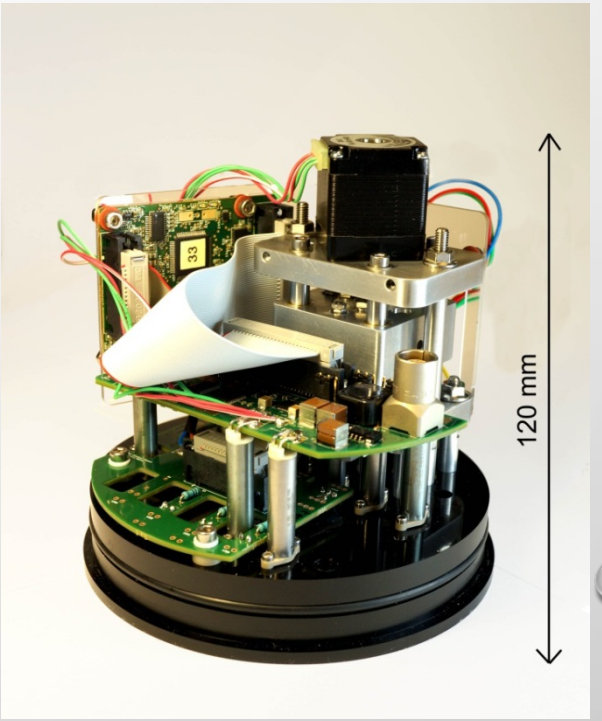
- Best Practice: documented procedure that, through experience and research, has consistently shown results superior to those achieved by other means and can be used as a benchmark, particularly if advocacy can lead to it being widely adopted

--- *and has a process for evolution*

- Best practices are technical, cultural, cost and convenience.

WHY BEST PRACTICES?

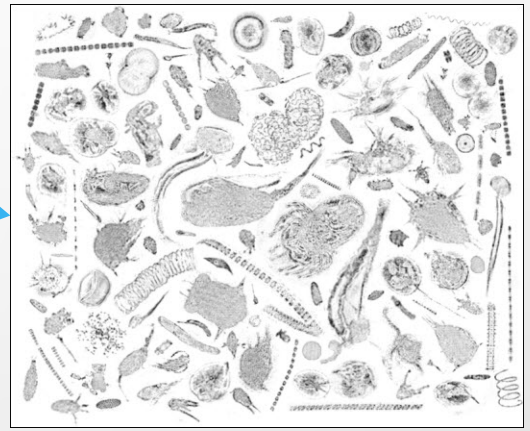


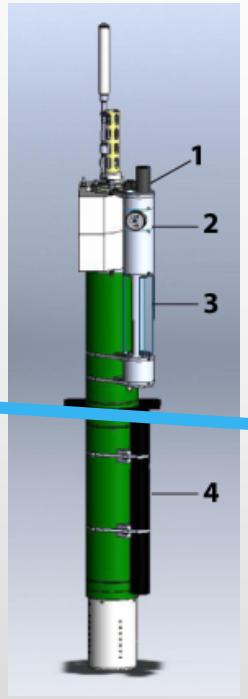


WHY BEST PRACTICES?

CPR

eDNA





Shipboard storage → Realtime, Quality control

THE CHALLENGE – FROM SAMPLE OF FIXO3

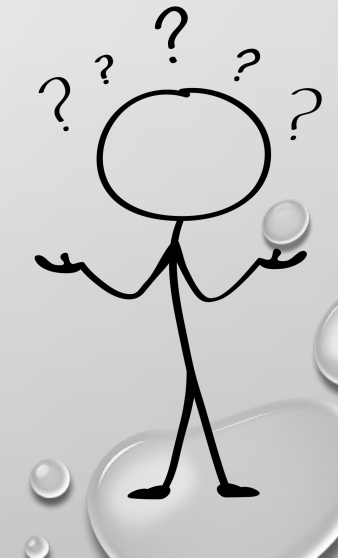
- Sensors should be visually inspected prior to calibration.

Pg 42 FixO3 Best Practices Manual

- Real-time monitoring of the conditions of the calibration bath can ensure the bath stability and homogeneity at the calibration points.
- Sensor handling and storage should follow the recommendations of the manufacturer. Sensor calibration should be performed prior to and after the deployment. The maximum period between two calibrations should not be more than one year.
- The calibration and the deployment history of the sensors should be available for traceability.

BEST PRACTICES QUESTIONS

- How much better would another practice have to be to justify a change in “baseline” practices?
- For different sites in the oceans, the best possible methods may be different – is there a uniform “best practice”
- Do we use a **carrot or stick** – if not used, then stamp of approval is withheld – labeling versus natural adoption?
- Term of BP could evolve from network practices including quality control – each group has its own best practice and it should be driven by the community as a whole.
- Find interrelation between observation networks – common areas metrology, calibration procedures, data processes – use best practices listing to facilitate convergence.
- When does a common practices become a best practice?
- When does a best practice become a standard?



WHAT IS THE PROCESS TO MAKE BEST PRACTICES WORK FOR OUR COMMUNITY?

- First thing (!) we must must document in writing best practices being used (not necessarily created) in each network. Outputs from networks may be a good starting place as this may be easily adopted.
- Repository of Best/Community Practices – acquisition, review workflow (certification?), discovery and dissemination
- Need some form of training and presentations at community fora
- Organization that can be a home for best practices
- Initialize the best practices through the practices available from the AtlantOS
- For sensors, should there be a Library of factory and other calibrations
- Encourage manufacturers to track feedback on field operation

WHAT IS THE PROCESS TO MAKE THEM WORK FOR OUR COMMUNITY? - 2

- Adapt procedures from industry to science – expensive procedures may be overkill.
- Community practice peer review process
- Cost and staff time needs to be identified so there is adequate allocation of resources for implementation of best practices.
- **Is there room for journal of best practices?** This will encompass peer review opportunities (define it carefully) and citations;

A Journal of Best Practices

- The Journal of Best Practices: A Memoir of Marriage, Asperger Syndrome, and One Man's Quest to Be a Better Husband

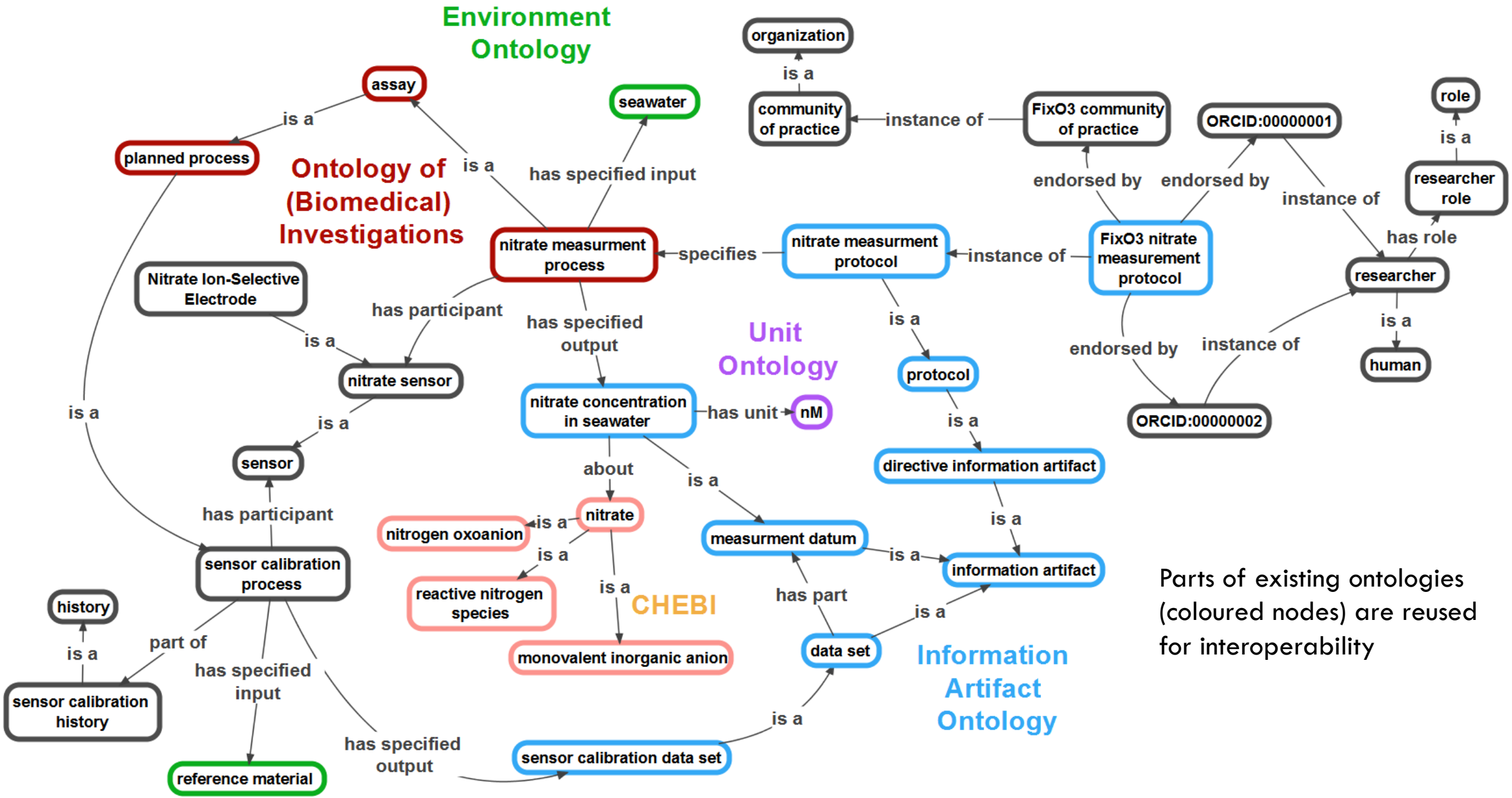
  by David Finch

PILOTS

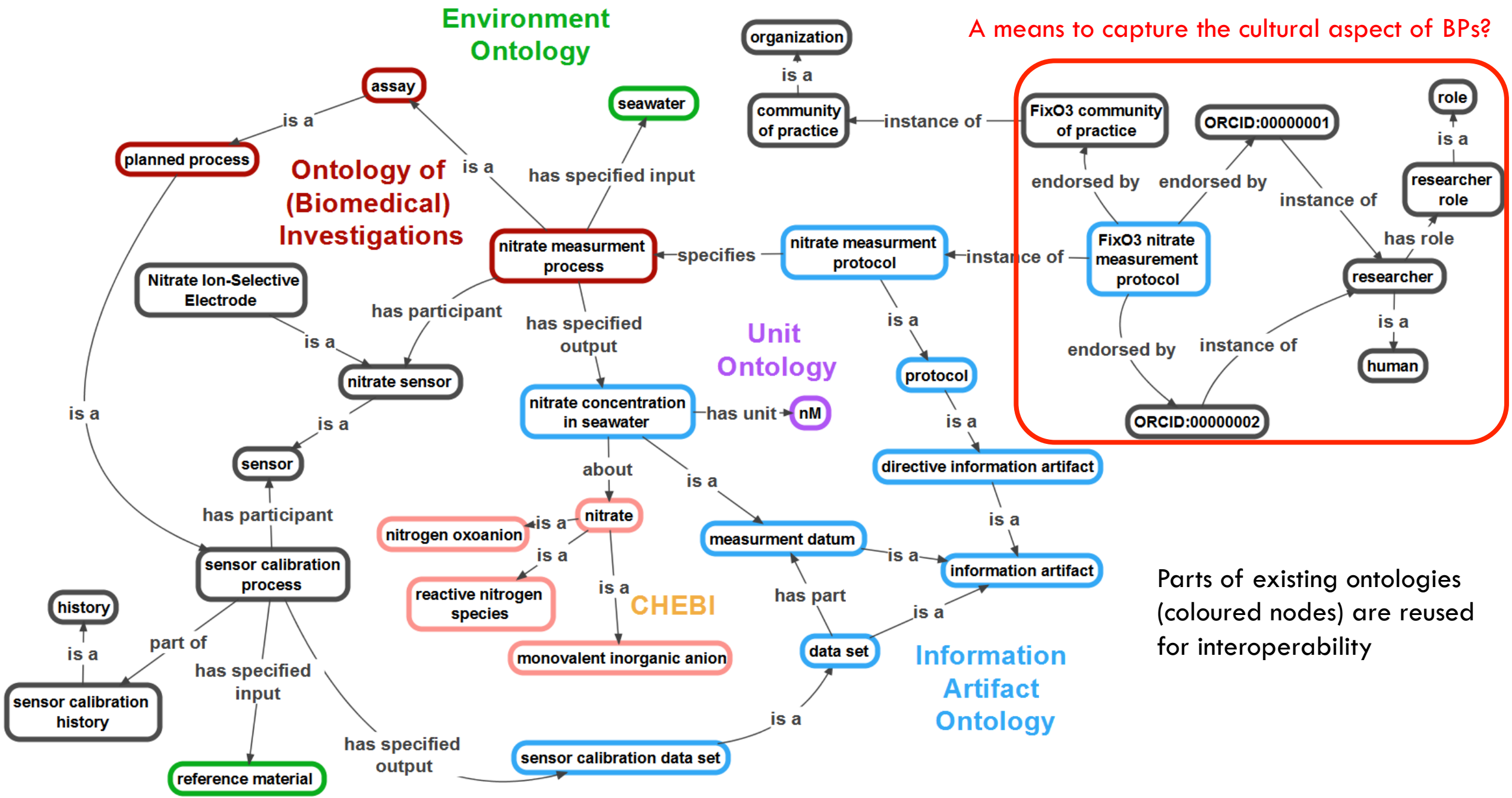
- Geotraces joint workshop best practices
- Data management
- IODE OceanDataPractices
- Platform related – FixO3/ARGO/GoShip – Implementation
- Sensor and platform combinations
- Downward particle flux
- Quality assurance
- Microbial genomics

ONTOLOGY-BASED SEARCHES

- Ontologies focus on the ***meaning*** or semantics behind terms and their interrelations, linking complex knowledge in a coherent way
- They can be **both human and machine readable**, and support different vocabularies – a common map for a diverse set of practices
- The ontology and its parts (e.g. terms, relationships) should be web-accessible and may point to other web accessible resources such as manuals or calibration data
- *Can form the basis of a transparent, computationally actionable, faceted, updateable, and searchable map of best practice knowledge*



Parts of existing ontologies (coloured nodes) are reused for interoperability



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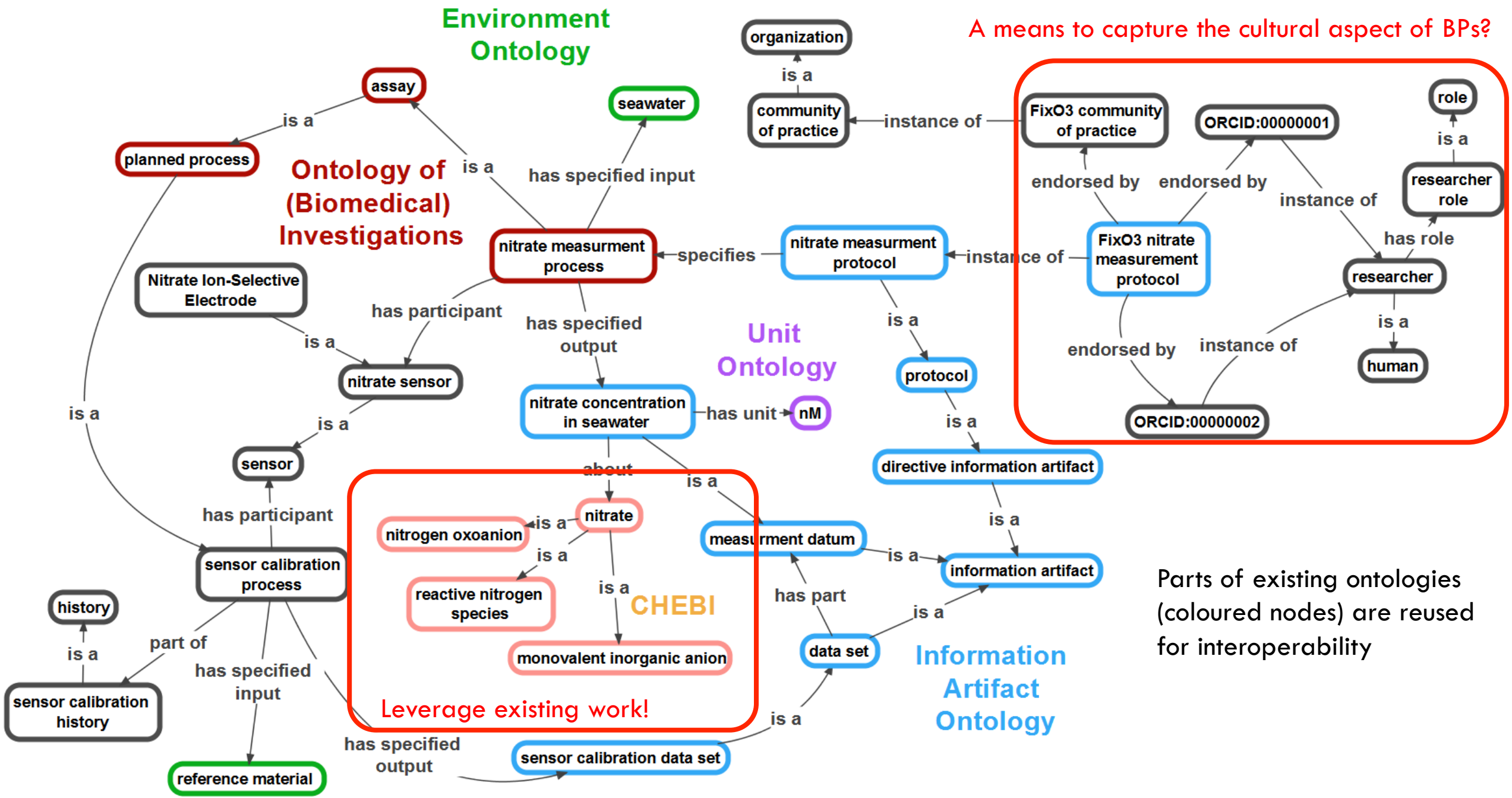
Environment Ontology
Ontology of (Biomedical) Investigations
Unit Ontology
CHEBI
Information Artifact Ontology
A means to capture the cultural aspect of BPs?
Leverage existing work!
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assay
planned process
seawater
organization
community of practice
instance of
FixO3 community of practice
ORCID:00000001
role
researcher role
endorsed by
endorsed by
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has unit
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directive information artifact
has participant
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nitrogen oxoanion
reactive nitrogen species
monovalent inorganic anion
measurment datum
information artifact
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sensor calibration history
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has specified output
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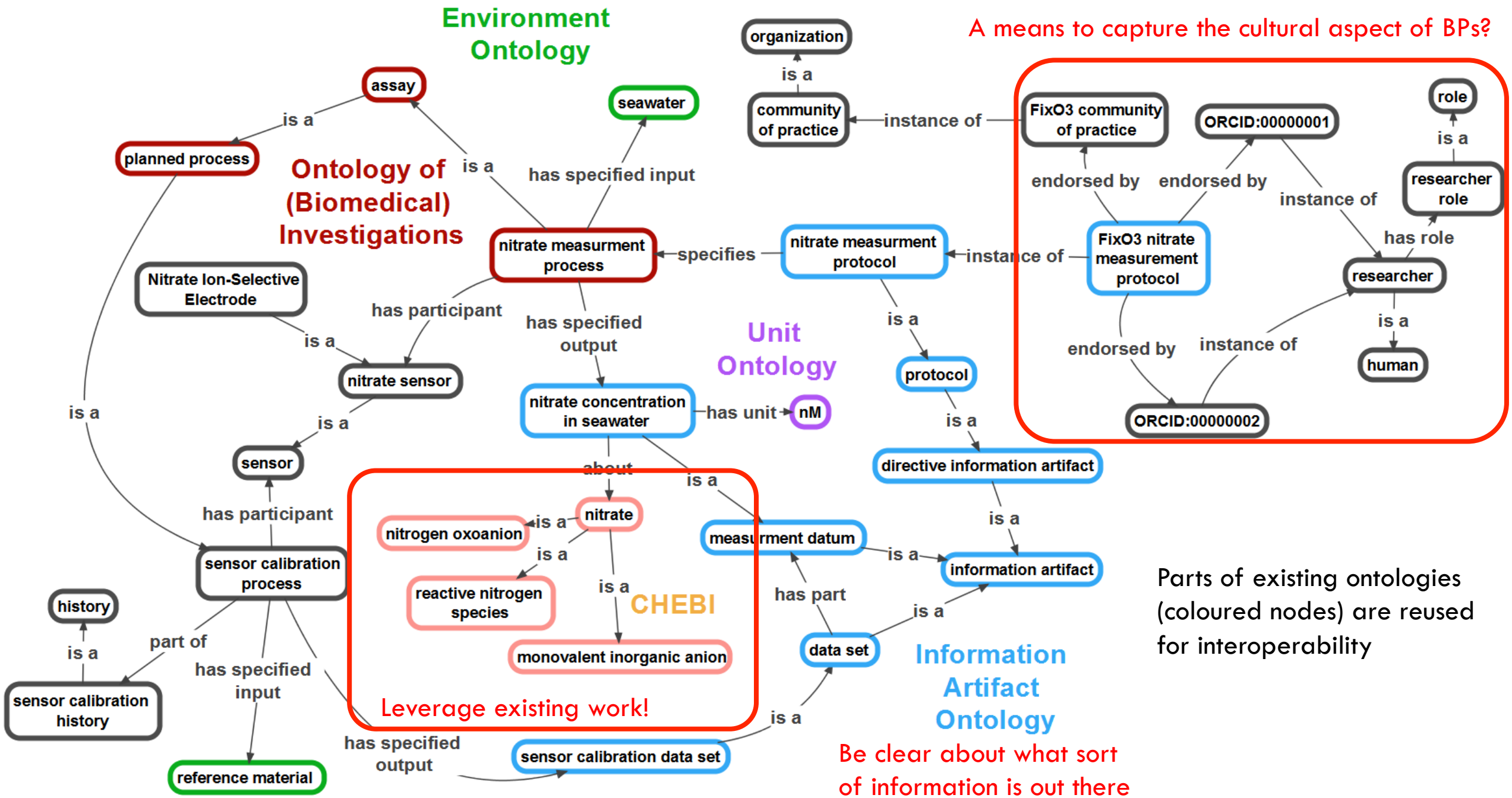
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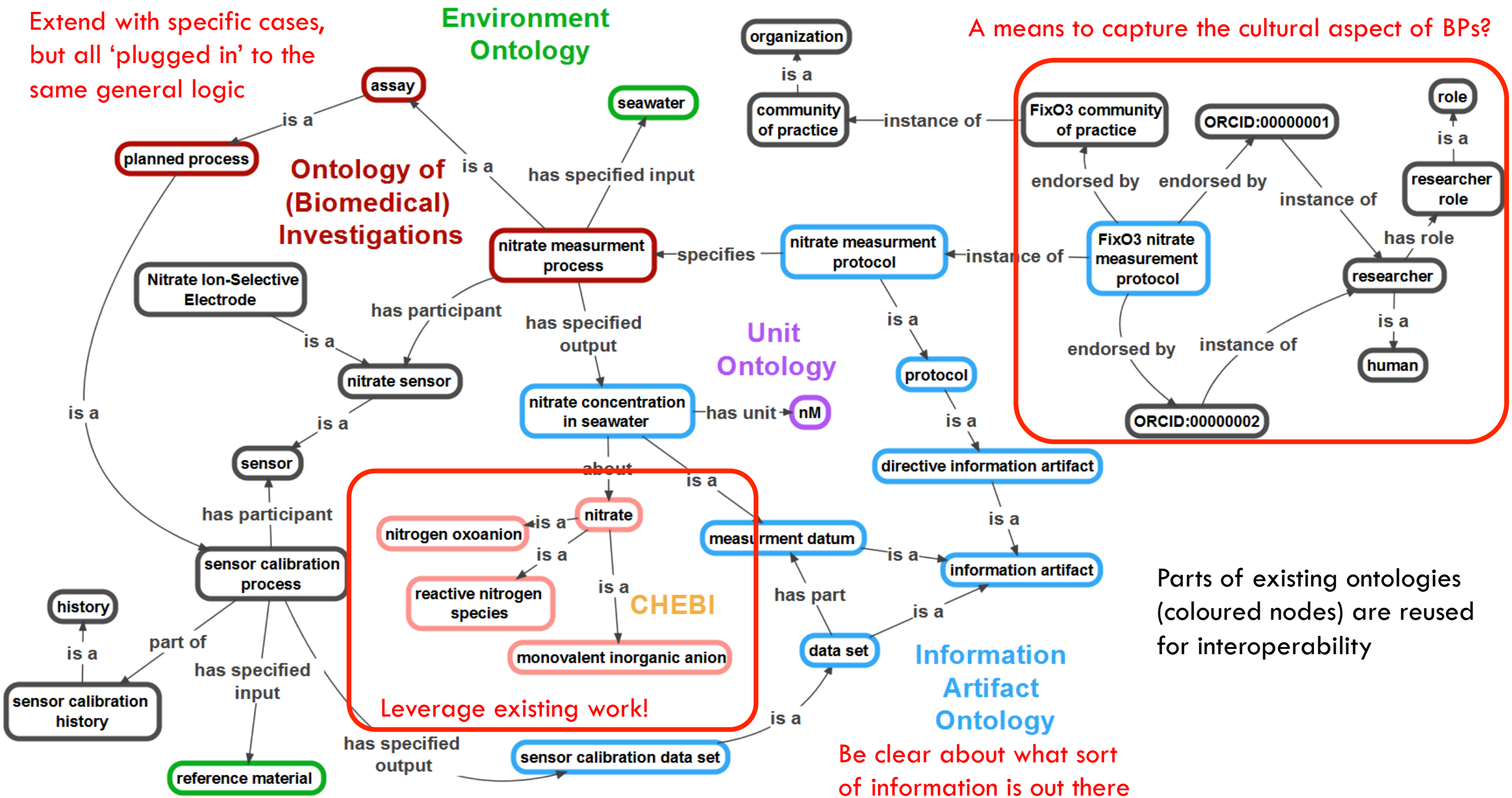
Extend with specific cases, but all 'plugged in' to the same general logic
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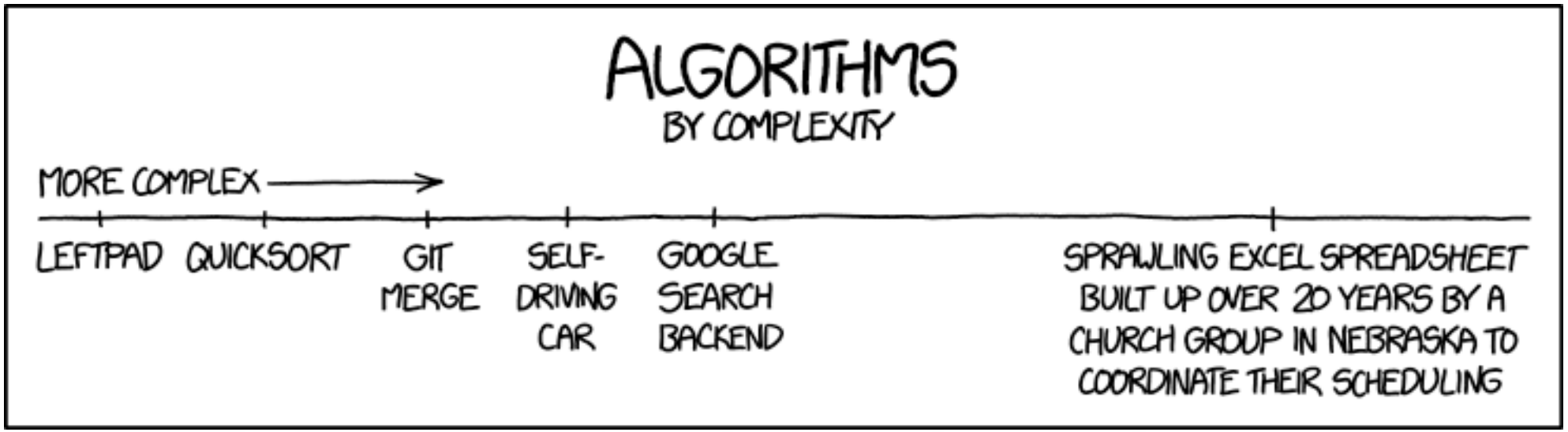

Randall Munroe - https://xkcd.com/1667/

STEPS FORWARD

Projects and organizations such as ODIP, IODE and AtlantOS are working in collaboration with Ocean Networks Canada, IOOS and selected European projects to address means of improved access to documented best practices

- Create a digital repository (collection) of Best/Community? Practices - in process
- Select Pilot areas - Initially sensors and data management
- Build an ontology based search demonstration – demo Early May
- Test and expand
- Address long-term processes and sustainability – under discussion

THANK YOU