

1 Context

In accordance with Resolution 2 of the General Conference of Weights and Measures in 2022, the BIPM is developing a web-based SI Digital Framework aimed at supporting the sharing of metrological data in line with the FAIR Guiding Principles for scientific data management and stewardship, namely

Findability, Accessibility, Interoperability and Reusability.

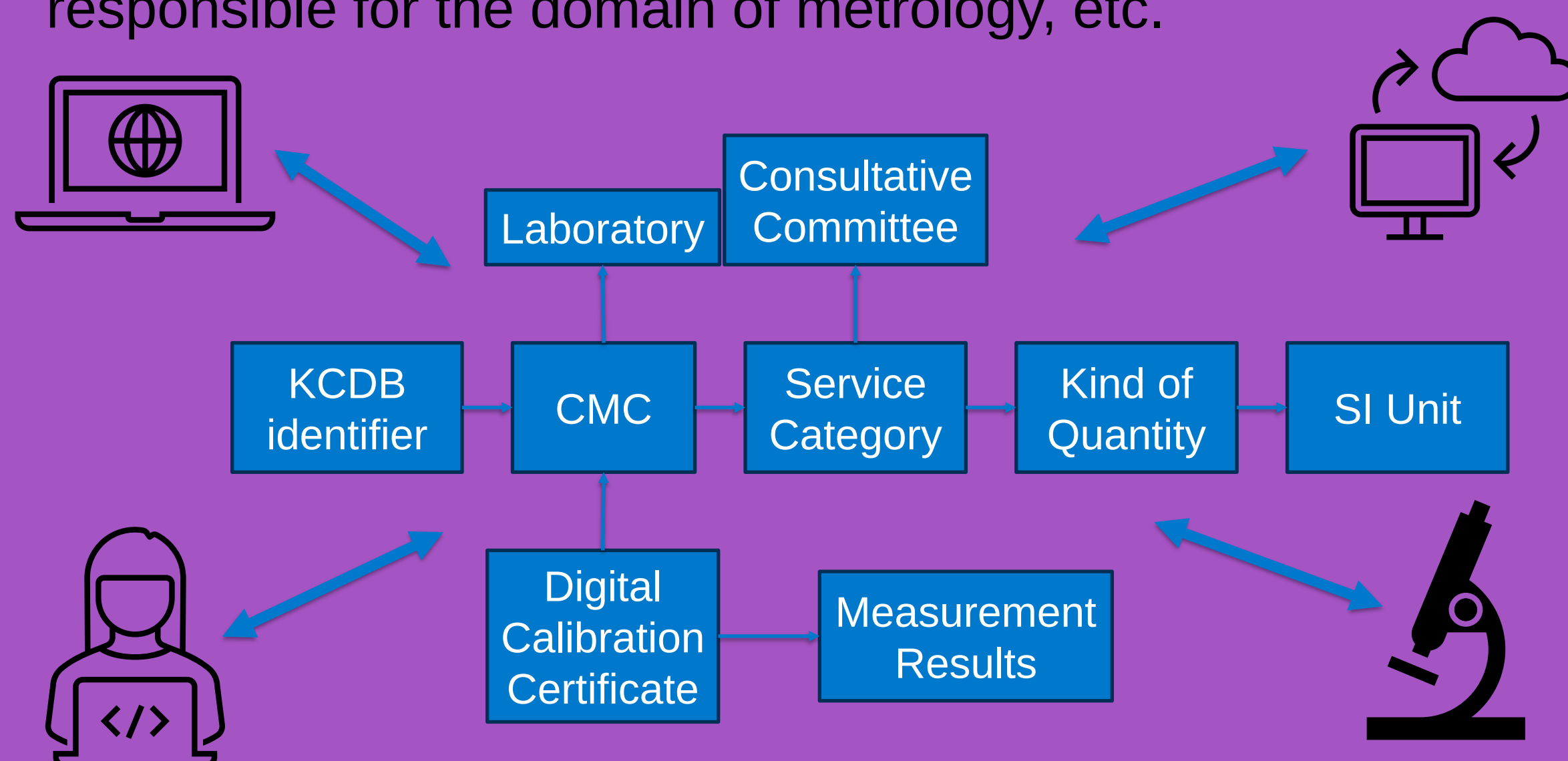


4 Call for action

The SI Digital Framework can be used to:

- link scientific data to the International System of Units digitally,
- facilitate the integration of digital certificates,
- refer to calibration and measurement capabilities.

For example, a scientist using the hyperlink functionality of a web browser or a software agent using standard HTTP-based protocols, can look up a declaration of Calibration and Measurement Capability based on its identifier in the KCDB. The SI Digital Framework allows not only the (permanent) retrieval of information about the declaration itself, such as, the service category, the associated laboratory, measurement range and uncertainty, but also the discovery of linked information, such as, the service categories, the definition of the associated SI unit, the body responsible for the domain of metrology, etc.



Digital transformation

The SI Digital Framework provides authoritative digital references for the concepts and things that fall under the responsibility of the CGPM and the CIPM.

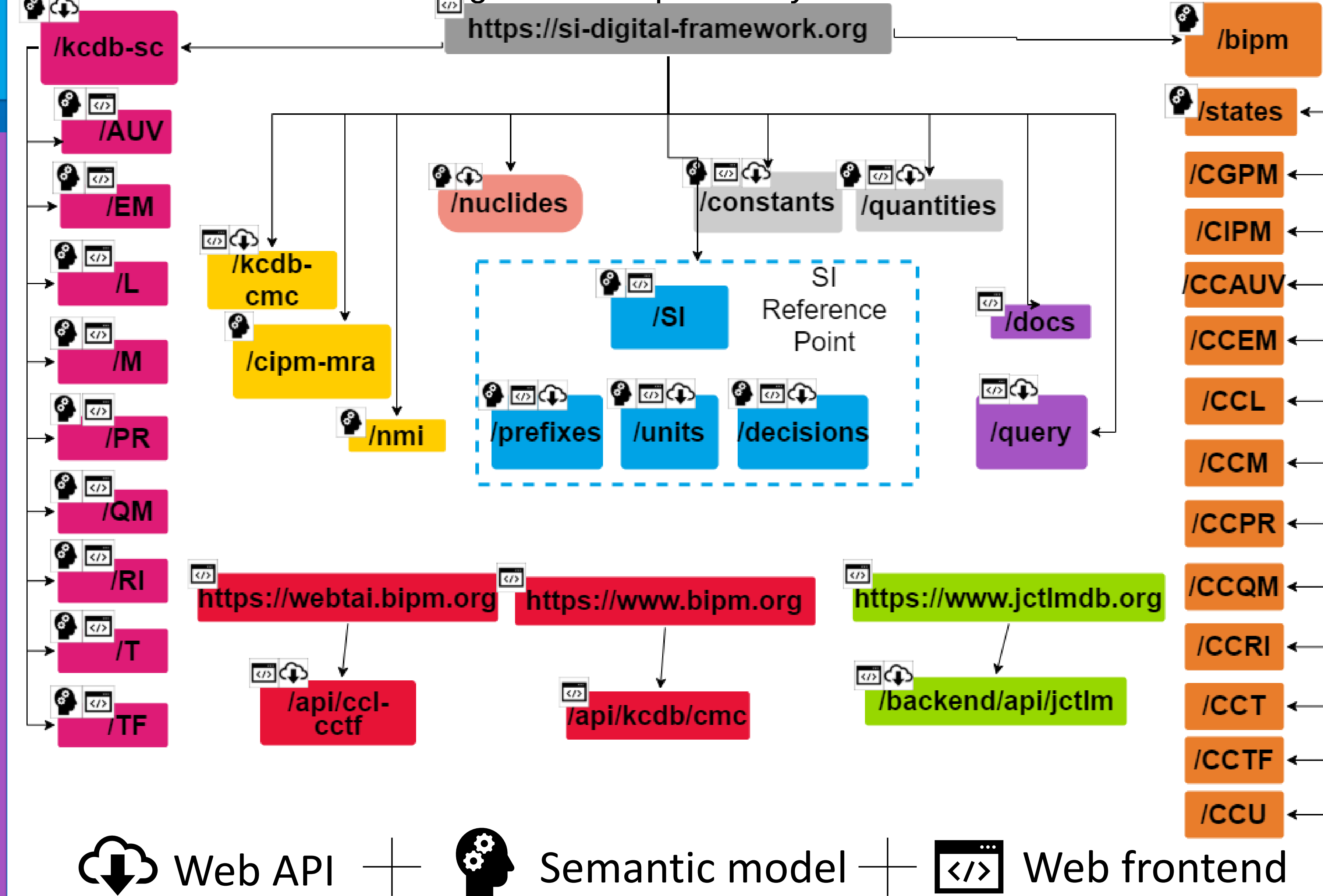
Starting with the SI Brochure and the KCDB as primary sources of truth, the Framework exposes the information available in existing BIPM websites and services in an alternative machine-actionable way.

Machine-Actionability

Leveraging the **Linked Open Data** paradigm to achieve a high level of compliance with the **FAIR Guiding Principles** for scientific data management and stewardship, the SI Digital Framework:

- assigns persistent and resolvable names for concepts and things (Uniform Resource Identifiers),
- exposes representations of concepts and things using W3C standardised protocols and languages (HTTP, JSON, RDF etc),
- formalises the meaning of concepts and things and their relationships (using the Semantic Web Ontology Language OWL),
- describes concepts and things with extensive metadata including provenance and domain-specific information from other FAIR vocabularies.

The SI Digital Framework is a collection of services and tools for humans and software agents underpinned by semantic models



5 Links and References

- Resolution 2 of the CGPM (2022) doi: 10.59161/CGPM2022RES2E
- R. Hanisch *et al.*, 'Stop squandering data: make units of measurement machine-readable', *Nature*, vol. 605, no. 7909, pp. 222–224, May 2022, doi: 10.1038/d41586-022-01233-w.
- M. D. Wilkinson *et al.*, 'The FAIR Guiding Principles for scientific data management and stewardship', *Sci. Data*, vol. 3, no. 1, p. 160018, Mar. 2016, doi: 10.1038/sdata.2016.18.
- Tim Berners-Lee's view on Linked Data <https://www.w3.org/DesignIssues/LinkedData.html>