UN/CEFACT Project Proposal

Project Name:	JSON-LD web vocabulary		
Date submitted:	8-Dec-2021	Proposed by:	Nis Jespersen

1. Project purpose

Required

Traditional document-based message exchange is only one way of integrating data across supply chains. A number of fast growing alternatives are emerging.

- Web APIs (Application Programming Interfaces) offer a more granular collection of distributed services designed to get data from the source of truth. So, rather than exchange data, just exchange references to the data – for example, given a containerID, then get more details about that container from BIC (https://www.bic-code.org/api-information-page/)
- IoT (internet of things) data streams provide a constantly updated stream of small data snippets from sensors on containers, gates, trucks, etc. So, rather than exchange documents about a thing, susbcribers can consume real time data streams - for example to get continuous information about the location of a vessel or the temperature in a container.
- DIDs (Decentralised Identifiers) and VCs (Verifiable Credentials) are fast being adopted as a scalable means to attach high integrity digital proof to physical things. For example, a traveller's covid vaccination certificate, or a supply chain certificate like a certificate of origin or phytosanitary certificate. Rather than being exchanged in a B2B or G2G channel, a VC is issued to a holder (eg a trader) and presented to a verifier (eg a regulator) who can verify authenticity and extract data without contacting the issuer.

All of these emerging technologies depend on common semantics in order to achieve scalability. But the semantics are managed as web vocabularies where each term has a specific meaning and can be composed dynamically in any order. In this world, the dictionary is more important than the document. The most popular syntax for publishing and managing these semantic dictionaries in JSON-LD. There are already a number of very important web vocabularies in use today.

- Schema.org is the worlds most used JSON-LD vocabulary. It contains hundreds of standard classes, some of which overlap with UN/DEFACT standards (eg https://schema.org/Organization). The full vocabulary is at https://schema.org/version/latest/schemaorg-current-https.jsonld
- GS1 is also publishing their standards as web vocabularies https://www.gs1.org/gs1-web-vocabulary
- IATA is moving quickly to support decentralized information sharing architectures – see https://www.iata.org/contentassets/a1b5532e38bf4d6284c4bf4760646d4e/one_record_tech_insight_decentralized_architecture_with_linked_data.pdf and has already published JSON-LD vocabularies - https://github.com/IATA-Cargo/ONE-Record/tree/master/working_draft/API/json-ld
- Even the W3C has started publishing a supply chain traceability vocabulary to support their DID/VC work for real implementations of verifiable credentials in the supply chain – see the specification here https://w3c-ccg.github.io/traceability-vocab/ and the actual vocabulary here https://w3c-ccg.github.io/traceability-vocab/contexts/traceability-v1.jsonld

UN/CEFACT has perhaps the world's most mature supply chain vocabulary (CCL and RDMs) and also an outstanding and trusted brand as a standards authority. But we do not publish our semantics in a usable way for modern web use cases. We risk losing relevance as a standards authority if we continue to focus only on document standards and do not support more modern technologies such as APIs, IoTs, and VCs. Therefore, the purpose of this project is to catch up with other semantic publishers and re-establish UN/CEFACT as the highest quality and authoritative publisher of supply chain semantic standards by publishing a UN/CEFACT JSON-LD vocabulary that includes all classes, properties, and code sets.

2. Project scope

Required

This project will deliver a high quality JSON-LD vocabulary published to a well-known unece domain and maintained throughout the ongoing development of the CCL, RDMs, and code lists. The vocabulary will be both human readable and machine readable and will support the international community in the development of interoperable APIs, IoT streams, and Verifiable Credentials. In order to support that outcome, the project will deliver

- A technical specification that describes the JSON-LD structure and architecture. This work is already 90% completed as a technical guidance note from the RDM2API project – please refer to "draft-rdm2api-json-ld-ndr-docx at https://uncefact.unece.org/pages/viewpage.action?pageId=43384856
- A human and machine readable JSON-LD vocabulary on a unece web domain. This works is already 90% completed and a draft vocabulary is available at https://service.unece.org/trade/uncefact/vocabulary/uncefact/ (human readable) and https://service.unece.org/trade/uncefact/vocabulary/uncefact.jsonld (machine readable)
- A publishing mechanism that allows the secretariat to continue to easily update the vocabulary as CCL, RDM, and code list changes happen.

3. Project deliverables and 4. Exit Criteria

Required (check all that apply)

Please note that the Bureau may reassess and change a deliverable after its completion at its discretion.

	Project deliverables	**Exit Criteria**
☐	Policy Recommendation	Public Review logs demonstrating all comments have been satisfactorily resolved; Final document ready for publication.
☐	Business Requirement Specification	
☒	Technical Specification	
☐	White Paper	Final document ready for publication.
☐	Green Paper	
☐	Requirement Specification Mapping	
☐	Core Component Business Document Assembly	
☐	Guidelines	
☐	Executive Guide	
☐	Brochure	
☐	Entries/alignment to the Core Component Library	Final deliverable ready for publication.
☐	XML Schema	
☐	UN/EDIFACT message	

☐	Internal UN/CEFACT Document	Final document ready for Bureau approval.
☒	Other (specify)	Published & maintained JSON-LD vocabulary

5. Project Team membership and required functional expertise

Membership is open to UN/CEFACT experts with broad knowledge in the area of:	CCL/RDM Business Semantics JSON-LD technology

In addition, Heads of Delegations may invite technical experts from their constituency to participate in the work.
Experts are expected to contribute to the work based solely on their expertise and to comply with the UN/CEFACT Code of Conduct and Ethics and the policy on Intellectual Property Rights.

6. HoD support

Required for Technical Standards, Business Standards and UNECE Recommendations. And at the request of the UN/CEFACT Bureau. A request for HoD support will be circulated to all HoDs in these cases. If you have verbal confirmation from specific delegations of their support, please list these here. Projects that require HoD support must obtain this within 6 months of Bureau provisional approval.

7. Geographical focus

The geographical focus of the project is global

8. Intial contributions

The following contributions are submitted as part of this proposal. It is understood that these contributions are only for consideration by the Project Team and that other participants may submit additional contributions in order to ensure that as much information as possible is obtained from those with expertise and a material interest in the project. It is also understood that the Project Team may choose to adopt one or more of these contributions "as is".

List any initial contributions:

- RDM2API-JSON-LD Vocabulary Guidelines – a deliverable from the RDM2API project can be re-used as the basis for the technical specification.
- https://service.unece.org/trade/uncefact/vocabulary/uncefact/ - existing published draft vocabulary can be re-used as the basis for a final vocabulary publishing framework.
- UNCEFACT Projects (unece.org) – Application Programming Interface Technical Specification (API TechSpec)

9. Ressource requirements

Participants in the project shall provide resources for their own participation. The existence and functioning of the project shall not require any additional resources from the UNECE secretariat.

Any additional request:	None

10. Proposed project leadership

(subject to Bureau approval)

Proposed:	Nis Jespersen	E-mail:	
Proposed:		E-mail:	

11. Milestones (repeat for each deliverable, if different)

The following are draft milestones of the project.

	ODP Stage	Expected Completion Date
Yes	Project Inception	1 month

Yes / No	Requirements gathering	☒	1 month
Yes	Draft development	☒	3 months (Very quick)
		☐	6 months (Quick)
		☐	12 months (Normal)
		☐	18 months (Normal)
		☐	24 months (Long)
Yes / No	Public Draft Review	☒	2 months
Yes	Project Exit	1 month	