

UN Transparency Protocol



Table of contents:

- About the UNTP
 - Incentives for sustainable supply chains are increasing
 - But endemic greenwashing risks devaluing the incentives
 - Challenges
 - The United Nations Transparency Protocol (UNTP)
 - Presentations & Videos
- Goals
- Target Audience & Benefits
 - Regulators
 - ESG Standards Organisations
 - Accreditation & Certification Organisations
 - Primary Producers & Manufacturers
 - Brands & Retailers
 - Recyclers & Refurbishers
 - Environmental & Human Welfare Organisations
 - Consumers
 - Transport & Logistics Providers
 - Financial Institutions
 - Industry Member Associations
 - Software Developers
 - Service Providers
- Success Measures
- UNTP Business Requirements
 - Governance Requirements
 - Architectural Requirements
 - Traceability & Transparency Requirements
 - Trust & Integrity Requirements
 - Security & Confidentiality Requirements
 - Compatibility & Interoperability Requirements
 - Implementation Requirements
- Relationships To Other Standards And Initiatives
 - Summary
 - Matrix
 - Expanded Descriptions
 - W3C Verifiable Credentials Data Model
 - W3C Decentralised Identifiers
 - ISO Product Circularity Data Sheet
 - CEN CENELEC Digital Product Passport Framework
 - ISO EPC Information Services
- UNTP in the Media
- Governance
 - UN/CEFACT Governance Framework
 - Voluntary Standard
 - UNTP Governance Details

- UNTP Extension Governance
- UNTP Consensus Driven Development Process
- UNTP Working Groups Structure
 - UNTP Steering Group
 - Adoption Working Group
 - Supply Chain Working Group
 - Conformity Working Group
 - Technical Working Group
- Release Management
 - UNTP Version and Release Management
 - Version Management
 - Release Management
- Steering Group
 - Terms of Reference
 - Mailing List
 - Meetings
 - Previous Meetings
 - 2025-06-26 Meeting Summary
 - Attendees
 - Key Discussion Points
 - Action Items
 - 2025-06-12 Meeting Summary
 - Participants
 - Summary of Contributions
 - Additional Comments
 - Action Items
 - 2025-05-29 Meeting Summary
 - Participants (Named)
 - Key Topics Discussed
 - Outcomes and Next Steps
 - 2025-05-14 Meeting Summary
 - Participants (Named)
 - Key Topics and Discussions
 - Next Steps
 - 2025-04-17 Meeting Summary
 - Key Participants
 - Discussion Highlights
 - Action Items
 - 2025-04-03 Meeting Summary
 - Meeting Summary
 - Agenda
 - Participants
 - Key Discussion Highlights
 - 1. Working Group Terms of Reference
 - 2. Sustainability Vocabulary Catalog (SVC) Draft
 - 3. Classification Concerns
 - AI and Automation Debate

- Next Steps
- 2025-03-20 Meeting Summary
 - Participants & Introductions
 - Key Discussion Points
 - 1. Governance Update
 - 2. Subcommittees Proposal
 - 3. Standards Integration
 - 4. Sustainability Vocabulary Catalog (New Work Item)
 - Next Steps & Action Items
- 2025-03-06 Meeting Summary
 - 1. Welcome and Introductions
 - 2. GS1 Commitment to UNTP
 - 3. UNTP Information Architecture Update
 - 4. UNTP Playground for Credential Validation
 - 5. Discussion: Bulk Materials & Digital Material Passport
 - 6. Closing Remarks
- 2025-02-20 Meeting Summary
 - Key Discussion Points:
- 2025-02-06 Meeting Summary
 - Key Topics Discussed:
 - 2. Change Requests & Technical Updates
 - 3. Implementation Guidance Page
 - 4. Certification and Standards Governance
 - Next Steps & Action Items:
- 2025-01-23 Meeting Summary
- 2025-01-08 Meeting Summary
 - 1. New Contributions and Implementation Commitments:
 - 2. Decentralized Access Control:
 - 3. Sustainable Mining and Conformity Credentials:
 - 4. Selective Disclosure in Supply Chains:
 - 5. Managing Mixed Commodities:
- 2024-12-12 Meeting Summary
- 2024-11-28 Meeting Summary
- 2024-11-14 Meeting Summary
- 2024-10-31 Meeting Summary
- 2024-10-17 Meeting Summary
- 2024-10-03 Meeting Summary
- 2024-09-19 Meeting Summary
- 2024-09-11 Meeting Summary
- 2024-09-05 Meeting Summary
- 2024-08-28 Meeting Summary
- 2024-08-22 Meeting Summary
- 2024-08-15 Meeting Summary
- 2024-08-01 Meeting Summary
- 2024-07-25 Meeting Summary
- 2024-07-17 Meeting Summary
- 2024-07-04 Meeting Summary

- 2024-06-27 Meeting Summary
- 2024-06-19 Meeting Summary
- 2024-06-13 Meeting Summary
- 2024-06-05 Meeting Summary
- 2024-05-30 Meeting Summary
- 2024-05-23 Meeting Summary
- 2024-05-16 Meeting Summary
 - Key Points Discussed:
 - Actions and Next Steps:
 - Closing Remarks:
- 2024-05-09 Meeting Summary
- 2024-04-25 Meeting Summary
- 2024-04-18 Meeting Summary
 - Participants:
 - Key Points Discussed:
 - Actions and Assignments:
 - Next Steps:
 - Closing Remarks:
- 2024-04-11 Meeting Summary
- 2024-04-04 Meeting Summary
- 2024-03-28 Meeting Summary
 - Attendees:
 - Key Points Discussed:
 - Action Items:
 - Closing:
- 2024-03-15 Meeting Summary
- 2024-02-29 Meeting Summary
- 2024-02-15 Meeting Summary
- 2024-02-01 Meeting Summary
- 2024-01-25 Meeting Summary
- 2024-01-18 Meeting Summary
- 2024-01-11 Meeting Summary
- 2023-12-14 Meeting Summary
- 2023-11-30 Meeting Summary
- Adoption Group
 - Mailing List
 - Meetings
 - Previous Meetings
 - Terms of Reference
 - Purpose & functions
 - Roles
 - Operation
 - 2025-05-29 Meeting Summary
- Supply Chain Group
 - Terms of Reference
 - Mailing List
 - Meetings

- Previous Meetings
- 2025-05-29 Meeting Summary
- Conformity Group
 - Mailing List
 - Meetings
 - Previous Meetings
 - Terms of Reference
 - Purpose & functions
 - Roles & Responsibilities
 - Operation
 - 2025-05-29 Meeting Summary
- Technical Group
 - Terms of Reference
 - Mailing List
 - Meetings
 - Previous Meetings
 - 2025-05-29 Meeting Summary
- Using Github
 - Markdown
 - Simple Changes
 - More Complex Changes.
 - Running a local UNTP website
- Business Case
 - The Business Case for UNTP implementation
 - Stakeholder Motivations
 - Business Case for Industry.
 - Business Case for Government.
 - Community Activation Program.
 - Value Assessment Framework.
- Business Case for Industry
 - Industry Cost Benefit Model
 - Benefits - Revenue Uplift
 - Market Access
 - Unit Price Uplift
 - Anti-Counterfeiting
 - Benefits - Cost Reduction
 - Compliance Costs
 - Finance Costs
 - Access to Trade Finance
 - Reduced Finance Costs
 - Improved margins
 - Cost of Goods Sold
 - Digitalisation Efficiency
 - Benefits - Corporate Value
 - Brand Reputation
 - Improved Disclosures
 - Costs - Sustainable Practices

- Process Improvement
- Audits & Certification
- Costs - Transparency System
 - Capital investment
 - Operational costs
- Industry Business Case Template
- Business Case for Government
 - Regulator Cost Benefit Model
 - Benefits - National Economy
 - Benefits - Compliance Outcomes
 - Benefits - Government Efficiency
 - Costs - Implementation
 - Costs - Operational
 - Regulator Business Case Template
- Community Activation Program
 - Introduction
 - CAP delivers value to industries and creates a flywheel of adoption
 - CAP supports a structured approach to extension development and adoption
 - A successful UNTP extension project is a team effort
 - A UNTP extension team requires specialist skills
 - CAP membership provides access to valuable resources
 - Starting a community is simple
- Ongoing Value Asessment
- Case Studies
- Specification
 - Architecture
 - Specifications
 - Best Practices
- Architecture
 - Overview
 - Principles
 - UNTP conceptual overview
 - The data
 - Finding the data
 - Securing the data
 - Understanding the data
 - Valuing the data
 - UNTP for one actor
 - UNTP for a value chain
- Verifiable Credentials
 - Overview
 - Business requirements for UNTP application of VCs
 - Verifiable Credential Profile
 - VCDM profile
 - DID methods
 - Render Method
 - Presentations

- Vocabularies
- Roadmap
- Digital Product Passport
 - Artifacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Ontology
 - Version History
 - Default Render Template
 - Sample Credential
 - Overview
 - Conceptual Model
 - Requirements
 - Logical Model
 - Core Vocabulary Documentation
 - DPP Documentation
 - Implementation Guidance
 - Verifiable Credential
 - Product Passport
 - Product
 - Dimensions
 - Due Diligence Declaration
 - Materials Provenance
 - Emissions Scorecard
 - Circularity Scorecard
 - Traceability Information
 - Conformity Information
 - Referencing Conformity Criterion
- Conformity Credential
 - Artifacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Ontology
 - Version History
 - Default Render Template
 - Sample Credential
 - Overview
 - Conceptual Model
 - Requirements
 - Logical Model
 - Core Vocabulary
 - DCC Documentation
 - Implementation Guidance
 - Verifiable Credential
 - Conformity Attestation

- Authorisations (Endorsements)
- Conformity Certificate and Auditable Evidence (Secure Link)
- Scope (Conformity Assessment Scheme)
- Assessment (Conformity Assessment)
- Sample
- Digital Traceability Events
 - Artifacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Ontology
 - Version History
 - Visualization
 - Sample Credential
 - Overview
 - Conceptual Model
 - Requirements
 - Logical Model
 - Core Vocabulary Documentation
 - DTE Documentation
 - Implementation Guidance
 - Verifiable Credential
 - Traceability Event
 - Transformation Event
 - Association Event
 - Aggregation Event
 - Transaction Event
 - Object Event
 - Item
 - Quantity Element
 - Sensor Element
- Digital Facility Record
 - Artifacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Ontology
 - Version History
 - Default Render Template
 - Sample Credential
 - Overview
 - Conceptual Model
 - Requirements
 - Logical Model
 - Core Vocabulary Documentation
 - DFR Documentation
 - Implementation Guidance

- Verifiable Credential
- Facility Record
- Facility
- Location
- Conformity Claims
- Identity Resolver
 - Overview
 - Conceptual Model
 - Working with DIDs
 - Requirements
 - Globally Unique Identifier Representation
 - Linked Data Needs
 - Uniform Resource Name (URN)
 - For existing IANA registered URN namespaces
 - For all other schemes
 - Uniform Resource Locator (URL)
 - IDR URLs as identifiers
 - Decentralised Identifiers (DID)
 - Universally Unique Identifier (UUID)
 - UUIDs as the complete identifier
 - UUIDs as the scheme specific identifier value
 - Discoverability
 - Data Carriers
 - Mapping to consistent URIs
 - Resolvability
 - Identity Resolver Services
 - Identity Resolver Example
 - IDR Query URL
 - IDR LinkSet Response
 - Creating the IDR Query URL
 - From a URN to IDR linkset
 - From a URL to IDR linkset
 - From a DID to IDR linkset
 - Link-set Response Variations
 - Defaults
 - Automatically Returning The Right Language
 - Secondary Resolvers
 - Versioned Targets
 - Creating New Links
 - Secure Targets
 - Resolver Service Workflow
 - Verifiability
 - Verifying Individual Credentials
 - Verifying Identity Integrity
 - Anti-Counterfeiting
 - Chain of Custody Accounting
 - Verifying Regulatory or Industry Standards Compliance

- Digital Identity Anchor
 - Artifacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Ontology
 - Sample Credential
 - Version History
 - Overview
 - Conceptual Model
 - Requirements
 - Logical Model
 - Core Vocabulary Documentation
 - DIA Documentation
 - Implementation Guidance
 - Digital Identity Anchor
 - Registered Identity
 - DIA Trust Anchors
 - DIA Discovery
 - Via DID Service Endpoint
 - Via Identity Resolver
 - DIA Use Cases
 - Business Registers
 - Facility Registers
 - Trademark Registers
 - Accreditation Registers
 - Land Registers
 - Product Registers
- Decentralised Access Control
 - Overview
 - Conceptual Model
 - Requirements
 - Decentralised Access Control
 - Anonymous public access
 - Item identifier as shared secret
 - Confidential data encryption
 - Decryption key as shared secret
 - Small footprint codes
 - Federated authentication workflow
 - Decentralised authentication workflow
 - Decentralised authentication protocol options.
 - Confidential data discovery
 - Implementation Considerations
 - Linked confidential data
 - N-tier supplier visibility
 - Durable storage
- Sustainability Vocabulary Catalog

- Artefacts
 - Stable Releases For Implementation
 - Release for Pilot Testing
 - Latest Development Version
 - Version History
 - Sample Conformity Vocabulary
- Overview
- Conceptual Model
- Requirements
- Conformity Vocabulary Schema
 - Minimum Implementation
 - Implementation Guidance
 - Logical Model
 - Sample Scheme Vocabulary
- Conformity Scheme Register
- Conformity Topic Classification
 - Machine Readable Versions
 - Human Readable Version
 - Top-Level Category 1: Ecological Resilience
 - Top-Level Category 2: Human Equity and Welfare
 - Top-Level Category 3: Ethical Governance
 - Top-Level Category 4: Product Integrity
 - Top-Level Category 5: Circular Value Chains
 - Top-Level Category 6: Economic Sustainability
 - Top-Level Category 7: Health and Safety Assurance
 - Top-Level Category 8: Systemic Sustainability
- Best Practices
 - Trust Graphs
 - Data Carriers
 - Anti-Counterfeiting
 - Mass Balance
 - ESG Rules
- Transparency Graphs
 - Overview
 - Trust Chains
 - Transparency Graphs
 - Verifying Graphs
 - Identity Verification
 - Conformity Criteria Verification
- Anti-Counterfeiting
 - Overview
 - Product Serial DID
 - Product Serial VC
 - Brand Trust Root
 - Public Verification
 - Private Acquittal
- Chain of Custody

- Overview
- Chain of Custody Categorizations
 - 1. Identity Preserved (IP)
 - Benefits
 - Challenges
 - Example
 - 2. Segregated (SG)
 - Benefits
 - Challenges
 - Example
 - 3. Mass Balance (MB)
 - Benefits
 - Challenges
 - Example
 - 4. Book-and-Claim (BC)
 - Benefits
 - Challenges
 - Example
- Transparency and Evidence
 - Third Party Attestations
 - Identity Preserved (IP)
 - Segregated (SG)
 - Mass Balance (MB)
 - Discoverable Evidence
- Book-and-Claim
 - Implementation
 - 1. Credential issuance
 - 2. "Booking" Credits
 - 3. Transferring (selling) credits
 - 4. Retiring credits
 - Outcomes
- Implementation Guidance
 - Implementation Of UNTP
 - Has Five Simple Steps
 - Details Vary With Your Context
 - Organisation Size
 - Organisation Type
 - Industry and Geographic Sector
 - And Some Key Dependencies
- Implementation Plans
 - For Producers Manufacturers and Brands
 - For Member Associations
 - For Registry Operators
 - For Scheme Owners
 - For Regulators
 - For Conformity Assessment Bodies
 - For Software Vendors

- For Consumers
- Test Services
 - Test Playground
 - Current release playground
 - Latest bleeding-edge playground
 - Full Test Service
 - 3 Tier Test Architecture
 - UNTP Testing (the blue sections in the diagram)
 - Tier 1: UNTP Test: Technology Interoperability Testing
 - Tier 2: UNTP Test: UNTP Schema Testing
 - Tier 3: UNTP Test: Trust Graph Testing
 - Extension Testing (grey boxes)
 - Tier 1: Extension Test: Nothing?
 - Tier 2: Extension Test: Extension Schema Testing
 - Tier 3: Extension Test: Choreography Testing (Trust Graph Validation)
- Implementation Support
- Reference Implementation
- Extensions Register
 - Extensions Methodology
 - Extensions Register
- Extensions Methodology
 - Overview
 - Extension Governance
 - Extension Methodology
 - Schema Extensions
 - Vocabulary Extensions
 - Identifier Schemes
 - Conformity Criteria
 - Extension Conformity Testing
- Extensions Register
 - Extensions Register
 - Extension Details
 - Responsible Business Transparency Protocol
 - Universal Data Protocol for the Global Built Environment
 - Australian Agriculture Traceability Protocol
 - Critical Raw Materials Transparency Protocol
 - Global Battery Alliance Transparency Protocol
 - International Copper Association Transparency Protocol

About the UNTP

! INFO

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

The United Nations Transparency Protocol (UNTP) aims to support governments and industry with practical measures to counter greenwashing by implementing supply chain traceability and transparency at the scale needed to achieve meaningful impacts on global sustainability outcomes.

Watch a 15 min overview of UNTP or continue learning more below:

UN Recommendation 49 Overview



Incentives for sustainable supply chains are increasing

Incentives for sustainable supply chains are increasing fast.

- Regulations such as the European [Regulation on Deforestation](#) (EUDR) and Carbon Border Adjustment Mechanism (CBAM) will present market access barriers or increased border tariffs for non-sustainable produce.

- These regulations impose [due diligence obligations](#) on entire supply chains, not just final products. Penalties for repeated non-compliance can be as high as 4% of global revenue.
- Financial institutions are rapidly moving to ensure that capital is preferentially focussed on ESG assets. [According to Bloomberg](#), within a few years, around \$50 Trillion or one third of all global assets under management will be ESG assets.
- Consumer sentiment is driving purchasing decisions to favour sustainable products. At the same time, consumers are increasingly mistrustful of unverifiable claims and look for third party certification based on trusted standards.

But endemic greenwashing risks devaluing the incentives

Greenwashing is a term used to describe a false, misleading, or untrue action or set of claims made by an organization about the positive impact that a company, product or service has on the environment or on social welfare. Just as the incentives described above provide a strong motivation for genuine sustainability in products, so they also provide stronger motivations for greenwashing.

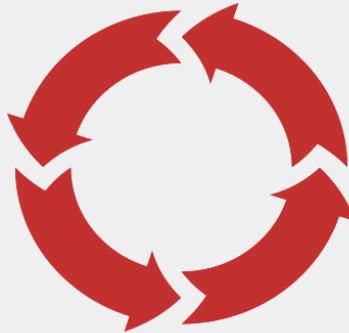
The evidence from multiple research activities is that greenwashing is already endemic with around 60% of claims being proven to be false or misleading. This presents a significant threat to sustainability outcomes. But there is room for optimism because around 70% of consumers expect higher integrity behaviour and are willing to pay for it. There are two plausible pathways ahead of us.

A Race to the Top



1. It is hard to fake claims
2. Consumer confidence improves
3. Higher prices are justified
4. Business is motivated to make provable claims

A Race to the Bottom



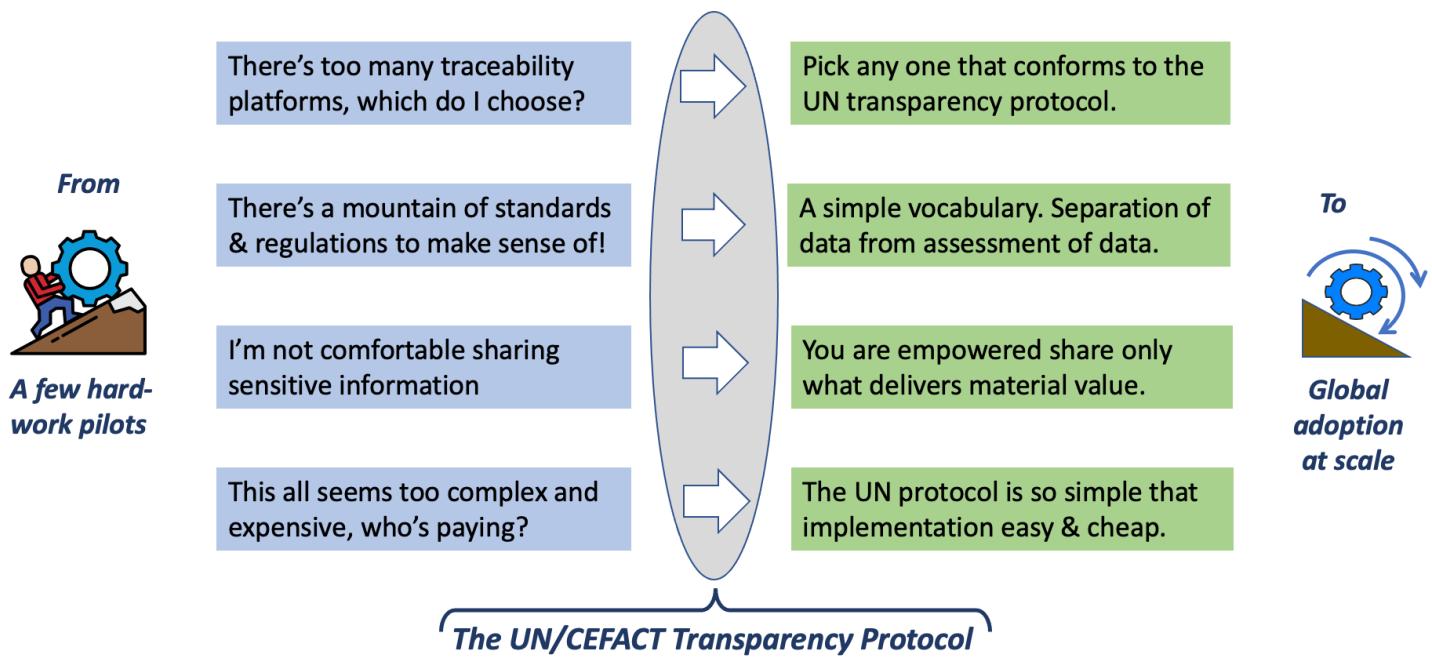
1. It is easy to fake claims
2. Consumer confidence drops
3. There's no price differential
4. Well-intentioned businesses fake claims to compete

To win the race to the top, fake claims need to be hard to make. The best way to achieve that is to make supply chains traceable and transparent so that unsustainable practices have nowhere to hide. But, to have any impact, the traceability and transparency measures must be implemented at scale.

Challenges

The world's supply chains must reach to the point where digitally verifiable traceability and transparency information is available to meet regulatory compliance, satisfy investors, and motivate consumers for the majority of products on the market. However, achieving transparency at that scale presents some challenges.

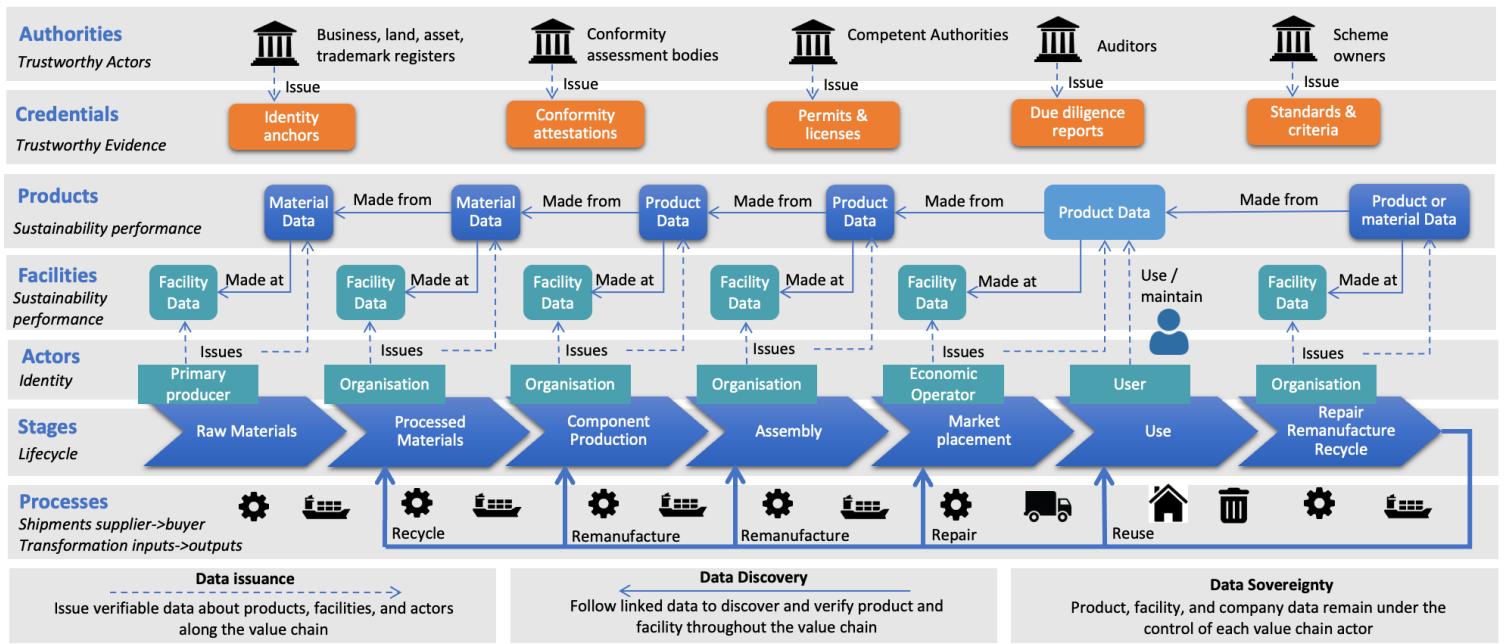
- **Which software to choose?** There are many traceability & transparency solutions on the marketplace. Many expect all actors in a given value chain to subscribe to the same platform in order to collect the data for end-to-end traceability. However, just as expecting your customers and suppliers to create accounts at your bank so that you can pay them is not rational or practical (that's why inter-bank payment standards exist), so the adoption of all actors in value chains to one platform is also not feasible or scalable. The UNTP is a standard protocol, not a platform, and assumes that supply chain data remains with each natural owner. So the answer to "which software to choose?" is "pick any, so long as it conforms to the UNTP".
- **Coping with a growing mountain of ESG standards and regulations.** The current count of ESG standards and regulations around the world runs into the thousands. Some are specific to particular commodities, jurisdictions, or ESG criteria and some cover multiple dimensions. There is very significant overlap between them and very little formal mutual recognition. The consequence is that it becomes very challenging for supply chain actors that sell to multiple export markets to know which criteria matter and how to demonstrate compliance. There is a risk that too much of the available ESG incentive is spent on demonstrating compliance and too little is left for implementing more sustainable practices. The UNTP does not add to the complexity by defining more ESG standards. Rather it seeks to minimise cost of compliance by making it simpler to test on-site ESG processes and data against multiple ESG criteria. Essentially this is about implementing a sustainable practice once and then re-using it to satisfy multiple overlapping criteria.
- **Protecting confidential information.** "Sunlight is the best auditor" and so verifiable transparency is the best greenwashing counter-measure. However, increased supply chain transparency for ESG purposes also risks exposure of commercially sensitive information. A viable transparency protocol must allow supply chain actors to share ESG evidence whilst protecting sensitive information. Rather than dictate what must be shared and what should not, the UNTP includes a suite of confidentiality measures that allow every supply chain actor to choose their own balance between confidentiality and transparency. The basic principle is that actors should be empowered to share only what delivers value.
- **Making a business case for implementation.** Each supply chain actor (or their software provider) will need to make a viable business case for implementation of the UNTP. The transparency incentives discussed in this section represent the benefit side of the equation. To keep the cost side as low as practical, UNTP has a strong "keep it simple" focus and offers a suite of implementation tools to further reduce cost. Some sample business case templates are provided to help actors make their case for action.



The United Nations Transparency Protocol (UNTP)

The UNTP provides a solution to the transparency challenges facing the world's supply chains. By implementing a simple protocol that can be supported by existing business systems, stakeholders will realise immediate benefits and will become visible contributors to the sustainability of global supply chains. Most importantly, UNTP is a **protocol, not a platform**, meaning that it focuses on interoperability standards that allow any technology platform to participate in interoperable and sustainable value chains.

The UNTP defines a relatively simple architecture comprising standards for [product data](#), [facility data](#), [traceability data](#), [conformity data](#), and [identity data](#). Each supply chain actor can independently implement UNTP without imposing technical dependencies on any other upstream or downstream actor. In this way, the traceability and transparency information describing arbitrarily complex value chains can "emerge" in a bottom-up manner, like pixels illuminating one by one on a TV screen. Additionally, the UNTP includes security and confidentiality tools that allow each actor to choose their own balance between confidentiality and transparency. The diagram below provides a conceptual model for the scope of UNTP and the value chain picture that it can reveal.



Presentations & Videos

- Short UNTP Presentation [PDF](#) [PPT](#)
- Longer UNTP Presentation [PDF](#) [PPT](#)
- Video presentation (15 mins) [Youtube](#)

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Goals

The primary goal of UNTP is to make significant reductions in the incidence of greenwashing by giving unsustainable behaviour nowhere to hide. This will also uplift the value of legitimate ESG credentials from supply chain actors that have implemented sustainable practices. UNTP will have achieved it's purpose when

Goals	Description
Most supply chain shipments are accompanied by verifiable ESG performance data.	In complex supply chains this means that at each supply chain step verifiable product and ESG information accompanies products via a Digital Product Passport.
Greenwashing is a niche activity that is easily detected and quickly penalised by markets and regulators.	Businesses that chose not to share verifiable information about their products are assumed to be doing the wrong things from an ESG perspective and therefore get lower prices for their products or lose access to markets.
Products with the best sustainability characteristics enjoy the greatest market access and price uplift.	Sharing data about your products becomes a competitive advantage and your business chooses to compete on the basis of high quality information.

Target Audience & Benefits

All stakeholders in the global supply chain have a role to play and benefits to realise through implementation of the UNTP. As explained in the [Architecture Overview](#), the UNTP is a decentralised architecture where actors can be issuers, or subjects, or verifiers of digital credentials. In many cases, actors will be issuers of some credentials, subjects of others, and verifiers of others. Therefore, the stakeholder roles and benefits described here are separated into the issuer, subject, and verifier roles as appropriate.

Regulators

Regulators define rules, issue permissions, and manage compliance. By implementing UNTP, regulators will uplift the value of the permissions they issue and improve the efficiency and integrity of compliance operations.

- The primary role of regulators as **issuers** is as a [trust anchor](#). When identity credentials such as business registration certificates are issued as digital verifiable credentials according to UNTP then the subjects of those credentials (trading businesses) can add strong verifiable identity to their supply chain transactions. Verifiable identity can facilitate green-lane pre-clearance at import border and higher confidence lending from financial institutions. Similarly, when ESG permits and certificates that demonstrate compliance with domestic regulations are issued digitally, then traders can also attach that evidence to their transactions. In short, when regulators act as digital trust anchors, they will be uplifting their balance of trade by improving access to export markets and trade finance for their traders.
- As **verifiers** of increasingly transparent supply chain data, regulators can significantly uplift compliance activities. Rather than depend on unverifiable claims in regulatory reports that are occasionally audited at high cost, regulators can confidently automate compliance assessment on most trade transactions, leaving a much smaller volume of trade for manual compliance and enforcement activities.

Finally, as national authorities increasingly seek to uplift environmental performance through regulatory initiatives such as consumer centric product passports, we recommend that national regulators consider the UNTP as the basis for their national initiatives. By designing national initiatives as [UNTP extensions](#), regulators will not only be able to re-use a rich and tested body of work, but will also reduce compliance costs for their domestic industry because they will be better aligned with international supply chains.

ESG Standards Organisations

Standards organisations include the national and international standards authorities as well as industry led organisations. There are a wide variety of governance arrangements in place that impact the legitimacy and value of the published standards. Unlike regulators, standards bodies do not manage compliance which can be self-assessed, or third party audited by test & certification bodies. There are hundreds of standards organisations which collectively issue thousands of ESG standards, each with dozens of specific conformity criteria (i.e. the rules). Most of these are published as PDF documents. The key role for standards authorities under UNTP is to make their ESG rules machine readable so that they can be accurately referenced in conformity credentials.

- When ESG standards organisations publish their [ESG criteria as a machine readable vocabulary](#) then they are empowering their community of certifiers to issue digital conformity credentials that unambiguously reference the scope of the conformity claims so that the credentials can be digitally verified.
- Standards authorities will generally not be issuers, subjects, or verifiers of digital credentials unless they also act as accreditation authorities for third party certifiers that will make conformity assessments - in which case they will be issuers of accreditation credentials as described in the next paragraph.

Accreditation & Certification Organisations

There is a very well established [global framework for conformity assessment](#) of entities, processes, and products that has been in place for over 50 years. It provides assurance that products sold on the marketplace meet applicable quality, safety or ESG standards. Under the framework, independent third parties (certifiers) assess products against recognised standards and issue conformity certificates. Furthermore, a global network of mutually recognised national accreditation authorities assess the certifiers to ensure that the conformity certificates are issued by suitably qualified organisations. For example, a manufacturer may claim that their product meets a particular environmental standard. You might ask "how do I know that claim is true?" and the answer would be "because a third party tested the product and issued a certificate". You might then ask "yes, but how do I

know that the third party can be trusted?" and the answer would be "because they have been accredited by the national accreditation authority". Despite all this, it's still a relatively simple process to create realistic looking but fake paper certificates. UNTP provides a standard way to digitally verify this chain of trust that is much harder to fake. UNTP does not demand that every product claim is third-party assessed, nor that every third party certifier is formally accredited, but does make that chain of trust visible where it exists. UNTP also recognises that less formal but still valuable chains of trust can exist - for example a farmer's environmental land management claims might be verified by a community organisation that is endorsed by a well-known global environmental organisation.

- When national accreditation authorities or other well-known and trusted organisations **issue** their accreditations as UNTP standard digital credentials then they are creating a digital [identity anchor](#) that empowers verifiers of ESG conformity certificates to decide whether they can be trusted. The **subject** of the accreditation is the third party conformity assessment body. Implementation of UNTP will amplify the value of the accreditation and the brand or 'trust mark' of the accreditation authority.
- When third party conformity assessment bodies (certifiers) **issue** their product ESG certificates as UNTP standard digital credentials then they are empowering verifiers of the ESG certificates to digitally confirm that the certificates are genuine, have not been tampered, and have not been revoked. Furthermore if the digital conformity certificate contains a link to the accreditation credential then the full [digital chain of trust](#) is established. Producers, manufacturers, brands & retailers that implement UNTP will also demand digital versions of the conformity credentials that they can attach to their products. Therefore, conformity assessment bodies that can provide UNTP standard digital credentials will be preferred over those that cannot.

Primary Producers & Manufacturers

Most physical products are made of materials that either grow above the ground or are dug out from below the ground. Primary producers such as farmers and miners represent the starting point for most supply chains. Recyclers are a special case and are treated separately by UNTP because they are both the end and the (re)start of circular supply chains. Manufacturers take raw or recycled materials and produce intermediate components or final products. Primary producers and manufacturers collectively represent the upstream feedstock supply chain for the branded products sold to consumers.

- When producers and manufacturers implement UNTP by **issuing** [B2B digital product passports](#) (DPP) and [linking them](#) to every shipment of goods to their customers, then they are simplifying life for their customers by providing data at the right granularity for them to incorporate their inputs such as scope 3 CO₂ emissions into their own product environmental footprint.
- When producers and manufacturers **issue** UNTP [traceability events](#) linked to product passports then they are providing provenance evidence that can inform supply chain resilience and preferential treatment decisions by their customers and export market regulators.
- When producers and manufacturers link third party issued UNTP [conformity credentials](#) then they are adding trust to the ESG claims in their DPPs that will uplift the value or market access for their products.
- When producers and manufacturers **issue** the complete collection of passports, traceability events, and conformity credentials and link them to product shipments then they will significantly uplift value to their downstream customers by empowering them to easily and verifiably meet their own ESG due-diligence obligations.
- When producers and manufacturers link their issuer identity to a strong identity credential (such as a government business registration or trademark ownership credential) and implement the UNTP [anti counterfeiting](#) mechanism then they will add strong anti-fraud measures to their products and preserve the value of their sustainability actions.

Producers and manufacturers are themselves **verifiers** of any UNTP credentials linked to their upstream supply chain. The **confidentiality measures** defined by UNTP allow supply chain actors to selectively redact upstream credentials before passing them on to their downstream customers so that ESG evidence can be passed on without revealing commercially sensitive information.

Brands & Retailers

Brands and retailers consume products from their upstream producers and manufacturers and sell to the consumer. Whilst it is of course true that some brands are also manufacturers and that some retail is to business rather than consumers, the key distinction that UNTP makes is between B2B activities vs B2C activities. Sales to the consumer market is highly regulated in most economies and some are starting to develop regulations that also require product passports to support informed consumer choice and/or improved recycling processes. Brands and retailers must meet domestic regulations and face scrutiny from an increasingly greenwashing-aware consumer as well as from environmental activist organisations. The potential for reputational damage and high fines for non-compliance present brands and retailers with a strong motivation to ensure that sustainable practices are in place both for themselves and their entire supply chain.

- When brands and retailers can **verify** UNTP credentials linked to shipments from their upstream suppliers then they can confidently meet their due-diligence obligations and have the rich and verifiable information necessary to issue any consumer-centric product passports required under domestic regulations.
- UNTP should not conflict with local regulations. When international brands and retailers **issue** UNTP **product passports**, **conformity credentials** and **traceability events** across all markets then they are providing a consistent way for consumers to discover and verify ESG performance and are establishing a strong framework for compliance with any current or emerging domestic regulations.
- When brands and retailers request UNTP credentials from their upstream suppliers then they avoiding the challenges associated with imposing specific traceability software solutions on their supply chain. Instead, they are simply requesting conformance with a common standard, irrespective of software platform.
- When brands and retailers that have already made significant investments in existing global identifier schemes and standards implement the UNTP, they can follow the global identifier scheme binding to build upon and re-use their existing investments.
- When brands and retailers link their issuer identity to a strong identity credential (such as a government business registration or trademark ownership credential) and implement the UNTP **anti counterfeiting** mechanism then they will add strong anti-fraud measures to their products and preserve the value of their sustainability actions.

Recyclers & Refurbishers

Recyclers & refurbishers play a critical role in the transition to a **circular economy**. Recyclers process used products into raw materials for re-use in new production processes. Refurbishers take old products and restore them for re-use. The goal of both processes is to improve sustainability outcomes by re-using natural resources rather than producing new raw materials. As regulators start to impose minimum recycled content requirements and other circularity regulations, the current linear economic model (produce, use, dispose) will require significant change to provide sufficient recycled materials to meet regulatory goals and consumer expectations. The UNTP is designed to support circular economies by including verifiable information on recycled content of products. UNTP also incentivises manufacturers to design new products to optimise recyclability and provides access to product data to better inform recycling processes.

- When manufacturers optimise their product design for recyclability and provide access to that information via **issued** UNTP passports then they are uplifting the end-of-life value of their products. Recyclers can leverage this data (especially for high value products like EV batteries) to optimise the efficiency of their recycling processes.
- When recyclers **issue** UNTP passports with their recycled material shipments, they are empowering their customers (manufacturers) to make verifiable claims about the percentage of recycled content in their products. This reduces the due diligence burden and non-compliance risk for manufacturers that face mandated minimum recycled content thresholds.
- When consumers see recycled content claims on products then they can **verify** them with confidence.

Environmental & Human Welfare Organisations

There are a large number of national and global not-for-profit organisations who's purpose is to promote environmental or human welfare causes. Some "trust marks", such as the WWF panda, have very high global brand recognition. Although these organisations don't have the enforcement teeth of regulators, they can strongly influence product market success when their trust mark is added (or revoked).

- When influential ESG trust marks establish well-governed accreditation frameworks and **issue** (or revoke) UNTP accreditation credentials then they are able to participate in the digital trust ecosystem as **identity anchors**, thereby multiplying the power of their brand to drive sustainable production practices.

Consumers

Consumer sentiment around sustainable production is strong and growing with over 70% of consumers in some economies actively choosing sustainable goods where possible. At the same time cynicism around greenwashing is increasing which acts to devalue sustainability claims. As greenwashing countermeasures such as UNTP and national regulations become widely adopted, it is reasonable to expect that consumers will become familiar with product passports and ESG verification techniques.

- When consumers can confidently **verify** the sustainability performance of products simply by scanning barcodes, QR codes or RFID tags then they will be more likely to choose products with verifiable and trustworthy ESG qualities over those that make unverifiable claims. When this behaviour is ubiquitous then consumers will have played a pivotal role in combatting greenwashing and winning the **race to the top**.
- When products are also equipped with the UNTP **anti-counterfeiting** measures then consumers can not only **verify** ESG performance but also confirm that the performance is associated with an authentic product and not a fake. Producers, manufacturers, brands, and retailers can be confident that their sustainability investments are not devalued by counterfeit products.

Transport & Logistics Providers

The movement of cargo by sea, air, and land accounts for around **10% of global emissions** and, unless transport itself becomes more sustainable, will account for the largest fraction of global emissions by 2050. Transport (especially by road) is therefore a key part of the emissions intensity of a product on the market. In the same way that UNTP makes ESG credentials discoverable from product batch identifiers, so UNTP allows ESG credentials for transport services to be discoverable from consignment

identifiers such as waybill numbers. But is it the buyer of goods or the seller of goods that is responsible to include transportation in the ESG footprint? The UNTP answer is that it follows the [INCOTERMS](#) - essentially whoever pays for the transport has the responsibility to include the transport in their product footprint. This ensures there are no gaps or double counting and that incentives are appropriately aligned.

- When transport & logistics providers **issue** UNTP transport credentials and link them to consignment identifiers then they are providing their customers with quantifiable and verifiable transport related ESG metrics to include in their product footprint. As producers, manufacturers, brands, and retailers seek to drive improvements in sustainability performance they will be incentivised to choose low emissions transportation services. This will uplift the value of sustainable transport services per tonne-kilometre.

Financial Institutions

Financial institutions are under increasing pressure from both regulators and the investment community to grant preferential terms for investment capital to sustainable businesses. The finance industry will increasingly verify sustainable performance via their customer annual reporting according to [IFRS sustainability standards](#). Just as financial transactions such as bills, invoices and payments aggregate up to corporate financial statements such as profit & loss and balance sheets, so corporate level annual sustainability metrics are constructed from operational data such as UNTP digital product passports. Furthermore, at consignment level, trade finance instruments such as documentary letters of credit normally require sufficient documentation for goods clearance to be presented prior to payment release. For cases where goods may be blocked at the border due to non-compliance with ESG regulations, then financial institutions will require ESG compliance evidence prior to releasing funds.

- When banks can use UNTP product passports and conformity credentials to digitally **verify** ESG compliance for shipments covered by letters of credit then they can more confidently release payment.
- When banks that are providing investment capital on sustainability grounds to businesses that have implemented UNTP then there is a clear line of sight from UNTP-based operational processes to IFRS-based corporate ESG performance, thereby reducing the financial risk associated with the investment.

Industry Member Associations

There are over 100,000 industry associations world-wide. Most represent a specific industry sector within a specific jurisdiction. These member associations typically provide advocacy on behalf of the community and offer best practice advice. In many cases the associations define quality standards and branding that distinguish their member's products in the marketplace (eg genuine [manuka honey](#)). These member associations are well positioned to assist their members in navigating the complexity of domestic and international ESG standards and in assisting them to implement the UNTP. When a particular association member engages in fraudulent practices then it can quickly damage the reputation of the entire industry. Therefore, member associations are strongly incentivised to ensure that their membership adheres to quality standards and to eject non-compliant members. This includes supporting the adoption of industry-wide sustainable practices and UNTP as the digital evidence of those practices.

- Industry member associations may add value to their membership by developing UNTP industry profiles that provide their members with targeted implementation guidance that meets the needs of their industry and jurisdiction.
- Industry member associations may develop training and implementation services, possibly in partnership with local service providers, thereby adding both a valuable service and also a revenue stream for the member association.

- Industry member associations may act as a trusted independent quota managers to counter [mass balance fraud](#) amongst their membership. The value of this service would be increased if the industry association is accredited by either a national accreditation authority or a global environmental or human welfare organisation.

Software Developers

Software developers provide the tooling that is needed to implement UNTP because they hold the data that is needed to **issue** UNTP credentials and they will also consume the data from UNTP credentials that are discovered and **verified**. This category includes enterprise resource planning (ERP) systems, ESG management systems, and traceability platforms. By implementing UNTP, software developers are empowering their customers to participate in global transparent supply chains. For large organisations with heavily customised systems, UNTP implementation may be a customer specific project. For smaller organisations that subscribe to off-the-shelf packages, UNTP conformity is more likely to be simply a new feature in a release roadmap.

- ERP systems are the natural issuers of UNTP product passports and traceability events because they manage the finance and logistics operations around the manufacturing, sales, and shipment of products.
- ESG management systems are the source of the ESG data such as carbon intensity that will populate UNTP product passports as well as the conformity credentials referenced by the product passport.
- Traceability platforms are used to provide traceability maps of the upstream supply chain. Rather than gathering this data by direct enrolment of upstream actors, UNTP provides a means to gather the same data by following verifiable linked data trails.

The three system types described here may exist in separate software products or may be parts of a more integrated system. Some ERP systems also manage ESG data. Some ESG platforms include traceability functions. It is not unlikely that ERP systems, whether through native product features or acquisition or partnerships, will evolve to offer this integrated set of capabilities to their customers. UNTP defines a simple and implementable standard for software developers to empower their customers to connect into global transparent and sustainable supply chains.

Service Providers

The adoption of UNTP by hundreds of millions of micro (under 5 employees) and small (under 50 employees) business will most likely be driven by implementation of UNTP as out-of-the-box capability by their chosen business software systems. However, the adoption of UNTP by tens of millions of medium (under 500 employees) and large (over 500 employees) business will most likely require some business analysis and systems integration investment. To minimise cost and risk, such businesses are likely to seek UNTP implementation support from a marketplace of experienced service providers.

- When service providers such as system integrators develop skills in UNTP implementation then they will be able to offer attractive service packages to their existing customers. They may also be able to leverage UNTP implementations skills to access new customers and markets.

Success Measures

Although reduced greenwashing and improved sustainability are the ultimate goals of UNTP, the most direct measure of success is uptake. Therefore, UNTP will measure uptake by counting the number of pledges (i.e. promises to implement) and the number of successfully completed conformity tests (i.e. actual implementations). For UNTP to achieve its goals, uptake will need to exceed the minimum thresholds shown in the uptake trajectory below.

Stakeholder type	2024 pledge	2024 implement	2026 pledge	2026 implement	2028 pledge	2028 implement	2030 pledge	2030 implement
Regulators	10	1	20	10	50	20	200	100
ESG Standards	10	0	20	10	50	20	200	100
Accreditation & certification	20	2	50	25	100	50	300	150
Producers & manufacturers	50	10	500	100	2,000	1,000	10,000	5,000
Brands & retailers	50	10	500	100	2,000	1,000	10,000	5,000
Recyclers & refurbishers	10	0	20	10	50	20	200	100
Transport & logistics	20	2	50	25	100	50	300	150
Financial institutions	10	0	20	10	50	20	200	100
Member associations	20	10	200	100	1,000	500	3,000	1,500
Software developers	20	2	50	25	100	50	300	150
Service providers	20	2	50	25	100	50	300	150

Actual progress towards these targets will be tracked via the [Implementations](#) pages.

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UNTP Business Requirements

This page provides a summary of the high level business requirements for UNTP, grouped into 7 categories. Each requirement is linked to the page(s) where the solution to the requirement is defined.

Governance Requirements

This set of requirements aim to ensure that UNTP is governed in an open and transparent manner, is freely available to all, and is extensible to meet specific industry and jurisdictional needs.

ID	Name	Requirement Statement	Solution Mapping
GV.01	Consensus driven process	UNTP development MUST be managed via a transparent and consensus-driven process that is open to contributions from all stakeholders - so that implementers can have confidence that the UNTP will meet their requirements.	Governance
GV.02	Freely available	The UNTP IP MUST be owned by the UN and be permanently free to access and free to use - so that implementers can have confidence that there will never be any fees for use or IP infringement claims.	Governance
GV.03	Backwards compatible	New minor versions of UNTP MUST be backwards compatible with earlier versions within the same major version. Each major version MUST remain active and supported for a minimum of 2 years - so that implementers can have confidence in the durability of their investment.	Governance
GV.04	Open source	UNTP implementation tools including reference implementations and test services MUST be available under open source and royalty free licensing - so that implementers can confidently use the tools to minimise their own implementation costs	Tools & Support
GV.05	Extensible	The UNTP MUST define a non-breaking extensions methodology - so that UNTP can be extended to meet specific jurisdictional or industry requirements and so that implementers of a registered	Extensions

ID	Name	Requirement Statement	Solution Mapping
		extension can be confident that their implementation is interoperable with UNTP core.	
GV.06	Reusable extensions	Industry and/or jurisdictional extensions to the UNTP SHOULD also be governed via an open process and released under royalty free license terms - so that implementers of extensions can have same fees & IP confidence as with UNTP core.	Extensions
GV.07	Implementation register	UNTP MUST provide a mechanism for implementers to register their planned and actual implementations - so that implementers can choose to register both their sustainability commitment and conformant solutions for discovery by a global community of users and/or customers.	Implementations

Architectural Requirements

This set of requirements aim to ensure that UNTP is scalable enough to achieve global implementations at a volume of global trade that is sufficient to have a material impact on greenwashing - by building on top of existing industry systems and practices and using the simplest possible framework that meets the goals.

ID	Name	Requirement Statement	Solution Mapping
AR.01	Protocol over platform	The UNTP MUST define a standard protocol that is easily implemented by any business software system - so that every supply chain actor can continue to use their preferred business software without any need for upstream or downstream actors to agree on the use of shared platforms.	Architecture
AR.02	Decentralisation	The UNTP MUST define a decentralised protocol where data is stored wherever the owner chooses - so that supply chain actors retain control of their data and are able to monetise their evidence of sustainable behaviour.	Architecture
AR.03	Natural business	The UNTP MUST accommodate the continued use of existing natural business, product, batch, and shipment identifiers - so that UNTP implementation imposes minimal disruption to existing business processes and can leverage existing business and product registers.	Identifiers

ID	Name	Requirement Statement	Solution Mapping
AR.04	Technical maturity	The UNTP MUST accommodate varying levels of technical maturity from (and including) paper based documents up to fully digitalised systems - so that every implementers of UNTP can confidently proceed without dependency on the capability or readiness of upstream or downstream actors.	Human Rendering, resolvability
AR.05	Simplest possible core	The UNTP MUST prioritise simplicity by focussing on only the minimum specification that represents the common core needs across different jurisdictions and industries - so that implementation cost is minimised and interoperability is maximised.	Architecture
AR.06	Re-use not re-invent	The UNTP MUST re-use (rather than re-invent) existing open and free standards (e.g. W3C Verifiable Credentials, UN vocabularies, etc) wherever they are fit for purpose - so that interoperability is maximised and existing investments in software components is re-used.	Architecture
TT.07	Rules as code	The UNTP MUST define a mechanism to simplify the compliance assessment of entities, products, and processes against the fast growing set of ESG standards and regulations - so that any actor's investment in sustainable practices is easily tested against multiple criteria.	ESG Rules

Traceability & Transparency Requirements

This set of requirements aim to ensure that UNTP provides the traceability and transparency data needed for each supply chain actor to confidently meet their due diligence obligations and customer expectations for verifiable evidence of sustainable practices.

ID	Name	Requirement Statement	Solution Mapping
TT.01	Data carriers	The UNTP MUST define consistent methods for the discovery of data about products from both new and existing data carriers such as ID bar codes, 2D matrix, QR codes, and RFID tags - so that any party that has only a product batch ID or goods shipment ID can find ESG data about that product or shipment.	Identity Resolver

ID	Name	Requirement Statement	Solution Mapping
TT.02	item/batch granularity	The UNTP MUST provide data at the granularity of the individual items or batch in a shipment so that the downstream actor can easily aggregate their material inputs (e.g. scope 3 emissions) into their own ESG performance data.	Digital Product Passport
TT.03	end-to-end traceability	Subject to privacy & confidentiality constraints, the UNTP traceability model MUST be able to trace value chains from finished product to raw materials through any number of commercial boundaries (sale of goods), or logistics boundaries (consolidation & deconsolidation), and process boundaries (manufacturing transformation of inputs to different outputs) so that the provenance and ESG footprint of goods can be verified as the sum of component parts.	Traceability Events
TT.04	Sustainability data	The UNTP MUST provide a simple and consistent way to access and verify all available sustainability metrics (eg carbon intensity, deforestation, water usage, fair work, etc) about a given product item or batch - so that product buyers can easily meet their sustainability and due diligence obligations	Digital Product Passport, Conformity Credential
TT.05	Provenance data	The UNTP MUST provide verifiable provenance information (raw material content and manufacturing origin countries) about a given product item or batch - so that product buyers can easily meet their supply chain resilience and goods origin controls.	Digital Product Passport, Guarantee of Origin
TT.06	Circularity data	The UNTP MUST provide a simple mechanism to access circularity data including both recycled content metrics as well as end-of-life recycling information - so that product buyers can meet their recycled content goals and recyclers can optimise their recycling processes.	Digital Product Passport, Circularity Data
TT.07	ESG Vocabulary	Given the volume and diversity of ESG standards and regulations, the UNTP MUST define a simple and scalable mechanism to define both the precise meaning and general category of ESG claims - so that downstream actors can map either the specific criteria or the general category of ESG data confidently.	Vocabulary

Trust & Integrity Requirements

This set of requirements aim to ensure that UNTP provides data that can be trusted and is resilient to several greenwashing attack vectors.

ID	Name	Requirement Statement	Solution Mapping
TI.01	Trust anchors	Trust in truth of sustainability claims can be established by third party audits, or by attestation of trusted authorities, or by long standing evidence of sustainable behaviour. The UNTP MUST provide a mechanism to link ESG claims to any or all of these "trust anchors" so that downstream actors can have confidence that claimed ESG performance is true.	Trust anchors
TI.02	Identity integrity	Identifiers of businesses, locations, products, and shipments underpin the UNTP. Therefore, the UNTP MUST provide a mechanism to verify that ESG claims made about products or locations or entities are made by actors that are genuine owners of the identifiers or their authorised delegates - so that downstream actors can be sure that ESG claims are made by parties genuinely authorised to do so.	Identity Anchors
TI.03	Accreditation	Third party audits and assessments add trust. But if the verifier does not know the auditor / certifier then there's a risk that define a mechanism to link third party certifiers to the accreditation authority under which they perform their work so that downstream actors can trust the certificates even when they do not know the certifiers.	Conformity
TI.04	Verification of documents	The UNTP MUST define standard and interoperable mechanisms to prevent spoofing or tampering of any documents issued by upstream actors so that downstream actors can be confident that ESG credentials were genuinely issued by the claimed identity and have not been altered in any way.	Verifiable Credentials
TI.05	Verification of graphs	Evidence of ESG performance in supply chains is not concentrated in one document but rather is distributed along the entire value chain. The UNTP MUST define a mechanism to describe and verify the collection of evidence that is available from chains of linked documents so that downstream actors can verify the full ESG footprint and provenance data for any shipment.	Trust graphs
TI.06	Product substitution	As the brand value of verifiably sustainable products increases, so does the incentive to make fake products and attach them to genuinely verifiable sustainability evidence. The UNTP MUST define an anti-counterfeiting mechanism so that downstream actors can confirm that they have purchased genuine goods.	Anti-counterfeiting
TI.07	Mass balance fraud	Mass balance fraud occurs when a supply chain actor blends sustainable materials with cheaper non-sustainable materials as inputs to a manufacturing process and then claims that the manufactured product is 100% sustainable. The UNTP MUST define mechanisms to detect mass	Chain of Custody

ID	Name	Requirement Statement	Solution Mapping
		balance fraud so that downstream actors can be confident of the integrity of their sustainable supply chain and the value of sustainable products is maintained.	

Security & Confidentiality Requirements

This set of requirements aim to ensure that UNTP provides mechanisms to protect the security and confidentiality of supply chain data, allowing each actor to make their own choices about the balance between traceability & transparency.

ID	Name	Requirement Statement	Solution Mapping
SC.01	Transparency vs confidentiality	The UNTP MUST allow every supply chain actor to choose their own balance between transparency and confidentiality - so that each actor can choose to share only what delivers value whilst protecting the information they deem confidential.	Confidentiality
SC.02	Multi-layered security	Information about products have a range of commercial sensitivity from public data to highly confidential data. The UNTP MUST provide a range of data protection mechanisms that can be applied appropriately so that supply chain actors can choose the right protection level for specific data sets.	Confidentiality
SC.03	Selective redaction	ESG data and credentials from sellers may contain data that buyers do not want to pass on to their own customers. The UNTP MUST define a selective redaction method that allows any supply chain actor to redact information (without affecting the cryptographic integrity) from credentials received from upstream suppliers before passing it on to their downstream customers - so that verifiable ESG data can be passed on without leaking commercially sensitive data.	Confidentiality
SC.04	Revocation	The UNTP MUST provide a mechanism to revoke previously issued conformity certificates when an actor is found to be non-compliant so that downstream actors can be confident of the currency of the ESG assessments they receive.	Verifiable Credentials
SC.05	Availability	UNTP MUST define a mechanism for high availability and long term durability of ESG evidence - so that data can be accessed by verifiers even when source systems are down, and so that data for long-lifetime	Verifiable Credentials

ID	Name	Requirement Statement	Solution Mapping
		products such as batteries or building materials can be accessed long after source systems are retired.	
SC.06	Cryptography	The UNTP MUST support flexibility in cryptographic methods so that new algorithms can be supported as they emerge to meet new challenges such as quantum computing.	Verifiable Credentials
SC.07	Key management	The UNTP MUST provide mechanisms for the discovery of public keys, the protection of private keys, and the rotation of key pairs so that keys remain secure and can be easily chained if compromised.	Verifiable Credentials

Compatibility & Interoperability Requirements

This set of requirements aim to ensure that UNTP is compatible with existing standards for technology, ESG criteria, and supply chain practices so that implementers can maximise the leverage of existing investments.

ID	Name	Requirement Statement	Solution Mapping
CI.01	National regulations compatibility	UNTP conformant data SHOULD be straightforward to map to national ESG regulations so that it can usefully provide the upstream B2B ESG evidence to support national B2C product conformance.	Vocabulary, Extensions
CI.02	Entity ESG reporting compatibility	UNTP conformant ESG data about products & shipments MUST be straightforward to map to entity level ESG reporting obligations so that UNTP transaction level ESG data can be easily aggregated to inform annual ESG reporting that conforms to standards like IFRS sustainability.	Vocabulary
CI.03	ESG standards compatibility	The UNTP MUST be able to support ESG claims against criteria from any ESG standard and MUST provide a mechanism to map those claims to a common vocabulary - so that implementers can align with standards of their choice and verifiers can make sense of the claims even when they are unfamiliar with specific standard criteria	Vocabulary
CI.04	Credential interoperability (VCs)	The verifiable credential technical landscape is fast moving. UNTP MUST be designed to work with multiple technical credential standards including W3C VCs, IETF JWT, ISO mDL. Furthermore,	Verifiable Credential

ID	Name	Requirement Statement	Solution Mapping
		UNTP should specify a minimal and simple profile of each so that interoperability between different implementations is maximised	Profile , Other profiles TBD
CI.05	Blockchain	Whilst some implementers MAY choose blockchain technologies to underpin their solutions, the UNTP MUST NOT require the use of blockchain for conformant implementations - so that implementers that wish to avoid the costs and complexity of blockchain technologies are free to do so.	
CI.06	Product identifier compatibility	There are a variety of well established product identifier schemes already in use by industry. The UNTP MUST allow industry to continue to use their preferred existing product identifiers schemes. Similarly UNTP MUST not preference any product identifier scheme over any other.	Identity Resolver
CI.07	Business and facility identifier compatibility	The UNTP MUST define a mechanism to support existing identity registers so that implementers can continue to leverage existing business identifiers such as tax registration numbers, facility identifiers, location identifiers, and so on under UNTP	Identifiers, Extensions

Implementation Requirements

This set of requirements aim to ensure that UNTP is implementable at the lowest possible cost, and that early implementers gain a marketing advantage, and that the impact of implementations can be tracked.

ID	Name	Requirement Statement	Solution Mapping
IM.01	Making a business case	Every UNTP implementer will need confidence that the benefits of their implementation outweighs the cost. UNTP SHOULD provide a set of business case templates so that each stakeholder type can fast-track their decision to proceed	Business Case
IM.02	Open source tools	The UNTP MUST include an open source reference implementation that any supply chain actor can embed into their solutions to help fast-track their implementation.	Tools
IM.03	Conformity testing	the UNTP MUST include a conformance test suite and test service so that each implementer can self-assess their conformance and be confident that their implementations will be interoperable.	Test service

ID	Name	Requirement Statement	Solution Mapping
IM.04	Implementation Support	UNTP MUST provide mechanisms for implementers to get either community support or professional support so that they can minimise their implementation risk.	Support
IM.05	Tracking implementations	UNTP MUST provide a mechanism to track implementations so that uptake and impact can be measured and so that early implementers can publicise their solutions.	Implementations
IM.06	Tracking extensions	UNTP MUST provide a mechanism to track and publish industry & jurisdictional extensions so that new extensions can find and re-use relevant work.	Extensions
IM.07	Tracking outcomes	Although uptake is a simple and concrete success measure, the real purpose of UNTP is to lift the value of sustainable practices by countering greenwashing. Therefore, UNTP MUST develop a set of greenwashing KPIs that can be tracked to assess whether UNTP is having a material impact.	Greenwashing KPIs

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Relationships To Other Standards And Initiatives

A core principle of UNTP is to avoid re-inventing standards by building upon existing work and maximising interoperability with similar initiatives. In many cases, UNTP provides complementary value to other initiatives (for example by providing a data exchange protocol for business standards). This page provides an overview of related standards and details the relationship with relevant UNTP specifications.

Summary

Standard	UNTP Relationship
W3C Verifiable Credentials (VCDM)	UNTP ensures data integrity by requiring that Product passports, conformity credentials, facility records, and traceability events are issued as W3C verifiable credentials.
W3C Decentralised Identifiers (DID)	UNTP ensures identity integrity by requiring that all credential issuers are identified by a W3C DID that is cryptographically linked to an authoritative register (of organisations or facilities or products)
ISO Product Circularity Data Sheet (PCDS)	UNTP provides a simple and interoperable mechanism to digitalise ISO PCDS using the DPP and DCC Declaration structure
CEN/CENELEC Digital Product passport System (CEN DPP)	UNTP will work to ensure interoperability where there is overlap (3 of 11 UNTP specifications). For example, whilst CEN DPP will define a specific data carrier and product identifier scheme, UNTP will support many existing industry schemes and so will include the CEN schemes in the list of supported schemes.
ISO Electronic Product Code Information Services	UNTP Digital Traceability Events present a simplified but conformant subset of ISO 19987 that is optimised for packaging as verifiable credentials.

Matrix

Expanded Descriptions

W3C Verifiable Credentials Data Model

Standard Overview

Credentials like drivers licenses, diplomas, visas, permits, and even invoices are integral to our daily lives. [W3C Verifiable Credentials](#) provide a mechanism to express these sorts of credentials on the Web in cryptographically secure, privacy-respecting, and machine-verifiable way.

UNTP Relationship

All UNTP credentials (product passports, facility records, conformity attestation, traceability events) are issued as Verifiable Credentials so that security and integrity is assured irrespective of how the credentials are exchanged. The additional UNTP requirement for VC rendering templates ensures that all UNTP credentials are both human and machine readable. The additional UNTP requirement for VC rendering templates ensures that all UNTP credentials are both human and machine readable. The [UNTP VC Profile](#) specification provides further details.

W3C Decentralised Identifiers

Standard Overview

[W3C Decentralised Identifiers](#)(DIDs) are a new type of identifier that enables verifiable, decentralized digital identity. A DID refers to any subject (e.g., a person, organization, thing, data model, abstract entity, etc.) as determined by the controller of the DID. The design enables the owner of a DID to prove control over it without requiring permission from any other party. DIDs are often used as the issuer identifier for Verifiable Credentials.

UNTP Relationship

UNTP [Verifiable Credentials Profile](#) requires the use of W3C DIDs as the issuer ID of all credentials (DPP, DCC, DTE etc) so that there is cryptographic and non-repudiable proof of the issuer identity. In some cases (similar to very well known websites), a verifier will be able to relate a DID to a well known identity. In most cases, however, the DID may not be known to the verifier - therefore UNTP defines a [Digital Identity Anchor](#) which provides a high integrity link between a DID and an identity in an authoritative register such as a national business register.

ISO Product Circularity Data Sheet

Standard Overview

[ISO-59040](#) (also known as the "Product Circularity Data Sheet") defines a standard set of measures and corresponding reporting standard for product circularity. It includes both circular content (i.e. the extent to which the product is made from recycled, refurbished materials) and circular design (i.e. the extent to which the product has been designed to facilitate repair and recycling). The standard is presented as a PDF document with sample reporting layouts.

UNTP Relationship

UNTP does not re-invent any of the criteria in the ISO PCDS. Rather the UNTP Digital Product Passport provides a simple mechanism to digitalise product circularity data in a way remains ISO-59040 conformant. The UNTP Digital Product Passport data model includes the organisation, facility, and product meta-data required by ISO-59040. The [Declarations](#) structure within the UNTP DPP data model can be used to convey each specific circularity criteria defined by ISO-59040. Since UNTP DPPs are both human and machine readable and can carry other sustainability information such as carbon footprint, product manufacturers can issue UNTP DPPs with confidence that the single DPP can conform to multiple sustainability standards and be equally valuable to human and machine verifiers.

Sample ISO-59040 conformant UNTP DPP - to be provided.

CEN/CENELEC Digital Product Passport Framework

Standard Overview

The [CEN/CENELEC Digital Product Passport Framework and System \(CEN EU DPP\)](#) is a new initiative that will deliver the underlying technical standards (data carriers, identifiers, data exchange) to support the [European Commission Eco-design for Sustainable Products Regulation \(ESPR\)](#). There are three outputs defined by the CEN DPP working group.

- [Unique Identifiers](#) - unique identifier system that supports both centralised and decentralised identifiers and supports product identification at the model, batch, or item level.
- [Data Carriers](#) - the format, error correction, encoding methods, printing & durability of the product data carrier (eg QR code).
- [Data Exchange Protocols](#) - An open, secure, reliable, and high integrity data exchange protocol for the exchange of DPP data between two or more systems. Includes access control mechanisms for sensitive data.

The CEN/CENELEC DPP standardization work is in-progress. This information will be refreshed as updated information is published.

UNTP Relationship

The UNTP is a voluntary standard that must be easy to apply to any existing industry specific product data carriers and identifiers - and must work within any member country regulatory framework. For example, 100 million livestock (sheep and cattle) in Australia are identified with RFID data carriers that carry [NLIS](#) identifiers and comply with national regulations. UNTP builds upon ubiquitous technical standards from W3C and IETF to ensure technical interoperability and will leverage semantic web technologies and established vocabularies for semantic interoperability. Therefore it is expected that interoperability with CEN/CENELEC DPP standards will be straightforward.

- **Identifiers and Carriers :** UNTP will maintain a human and machine readable register of organisation, facility, and product identifier schemes together with data about how to parse data carriers, resolve identifiers to discover passports, and verify ownership of the identifier and integrity of the passport. Any EU product registers that implement CEN standards will be added to the UN register of schemes.
- **Data Exchange Protocol :** UNTP leverages open technical standard including [JSON Schema](#), [W3C JSON-LD](#) semantics, and [IETF Linksets](#). CEN DPP is likely to leverage similar technical standards. Furthermore, UNTP Digital product passport data is mapped to well established semantic vocabularies such as [vocabulary.uncefact.org](#), [schema.org](#) and others as

needed. UNTP will maintain mappings to any EU specific passport data semantics to ensure interoperability at the semantic level.

This information will be refreshed as updated information is published. UN/CEFACT remains committed to ensure interoperability with CEN/CENELEC DPP standards as they emerge.

ISO EPC Information Services

Standard Overview

ISO/IEC 19987:2024 is a well established standard for supply chain traceability. It defines six event types that can be combined as required to accurately describe a value chain from raw material to finished product. The event types are **Object Event** (eg an inspection), **Transaction Event** (eg a shipment of goods from seller to buyer), **Aggregation Event** (eg loading multiple packages on a pallet), **Transformation Event** (eg manufacturing process that consumes input materials to create output products), and **Association Event** (eg linking products to other products or facilities).

UNTP Relationship

The UNTP [Digital Traceability Event \(DTE\)](#) is a conformant and simplified profile of ISO-19987 that identifies the minimum subset that is necessary to support value chain transparency. The UNTP DTE profile is also optimised for packaging as verifiable credentials and discovery as linked data - rather than the machine-to-machine API mechanisms defined by the ISO standard.

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UNTP in the Media

Date	Type	Publisher	Title	Description
Mar 2025	Conference	Asian Development Bank	Asia-Pacific Trade Facilitation Conference 2025 - Presentations	UNTP presentation at ADB/UNCTAD/ESCAP sustainable trade facilitation conference
Feb 2025	Report	International Energy Agency	The Role of Traceability in Critical Mineral Supply Chains	Positions the UNTP as a key component of an effective mineral traceability system.
Feb 2025	Strategy paper	Queensland Department of Natural Resources and Mines	Strengthening critical minerals provenance and traceability	References UNTP as the international standard for traceability and recommends alignment as part of the implementation roadmap
Feb 2025	Blog	The Aeolian	From Compliance to Opportunity Part 1 Part 2	Excellent articles that explain how UNTP works, starting with simple cases and gradually adding complexity to match real world scenarios
Dec 2024	National Framework	AgTrace Australia	Australian Agricultural Traceability Protocol	AATP is the first registered UNTP extension, supporting the Australian Agriculture Industry.
Nov 2024	Newsletter	The CopperMark	Public Consultation - COnsolidated Mining Standard	Announcement of CopperMarck and TSM (Towards Sustainable Mining) implementation plan for UNTP
Nov 2024	Conference	Standards Australia and International Code Council	Universal Data Protocol for built environment	Joint announcement by Standards Australia And International Code COuncil at COP29 - UNTP as the basis for a Universal Data Protocol for built environment sustainability

Date	Type	Publisher	Title	Description
Sept 2024	Podcast	Traceability Insider	Exploring the role of UNTP in Global Transparency Revolution	A podcast with a fairly complete Q&A on all technical and business aspects of UNTP
July 2024	Forum Conference	UN/CEFACT July 2024 forum	Identities in Trade, Protocols over Platforms, Digital Product Passports, Trust in Trade	Multiple UNTP presentations at the UN/CEFACT July 2024 forum in Geneva.
June 2024	Newsletter	British Columbia Government	Energy & Mines Digital Trust Pilot	UNTP digital conformity credentials used for pilot of Mines Act Permit
May 2024	Consultation paper	Australian Government Department of Agriculture	Enabling Agricultural Traceability through Data Interoperability	References both UNTP and AATP as candidates for a national agricultural traceability architecture.
March 2024	Newsletter	UN Trade and Development (UNCTAD)	Unlocking transparency: The promise of the UN Transparency Protocol for global trade	Describes the UNTP and recommendation 49 as an architecture for global scalability of traceability and transparency in trade
March 2024	Meeting presentation	World Trade Organisation	March 2024 MSME WG meeting, Recommendation 49 presentation	Recommendation 49 and UNTP presentation at WTO Micro, Small & Medium Business Working Group meeting.

Governance

! INFO

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The UNTP governance framework follows UN/CEFACT standard governance methodology and is designed to provide implementers with confidence that UNTP:

- is a public good that cannot be captured by any specific commercial interest and is permanently free to use.
- is developed via a consensus based process that ensures it will meet the needs of value chain actors and member states.
- is specific, testable, and rigorously versioned so that implementers can be confident of stability and interoperability.
- is compatible with relevant national and international standards and regulations.

The governance framework described on this page is designed to meet these criteria.

UN/CEFACT Governance Framework

[UN/CEFACT](#) is the United Nations Centre for Trade Facilitation and Electronic Business. It was established as an intergovernmental body in 1996 with a mandate to develop standards and recommendations for the facilitation of digitalised and sustainable trade. Although UN/CEFACT is a global body, secretariat functions are provided by the United Nations Economic Commission for Europe ([UNECE](#)). The UN/CEFACT mandate, terms of reference, program of work, and related governance documentation is available from the [UN/CEFACT policies and procedures](#). The governance documents are approved by member states at the UN/CEFACT annual plenary.

Standards such as this United Nations Transparency Protocol (UNTP) and recommendations such as Recommendation 49 "Transparency at scale" are developed under the UN/CEFACT Open Development Process ([ODP](#)). All contributing participants in UN/CEFACT working groups must [register as UN experts](#) with the approval of their country head of delegation. All contributing participants must waive their intellectual property rights (IPR) to any contributions under the [IPR policy](#) so that UN/CEFACT can continue to publish freely usable standards and recommendations.

UN/CEFACT maintains formal liaison arrangements with other UN organisations as well as other global standards bodies such as ISO, ITU, and IEC following a [memorandum of understanding](#).

Voluntary Standard

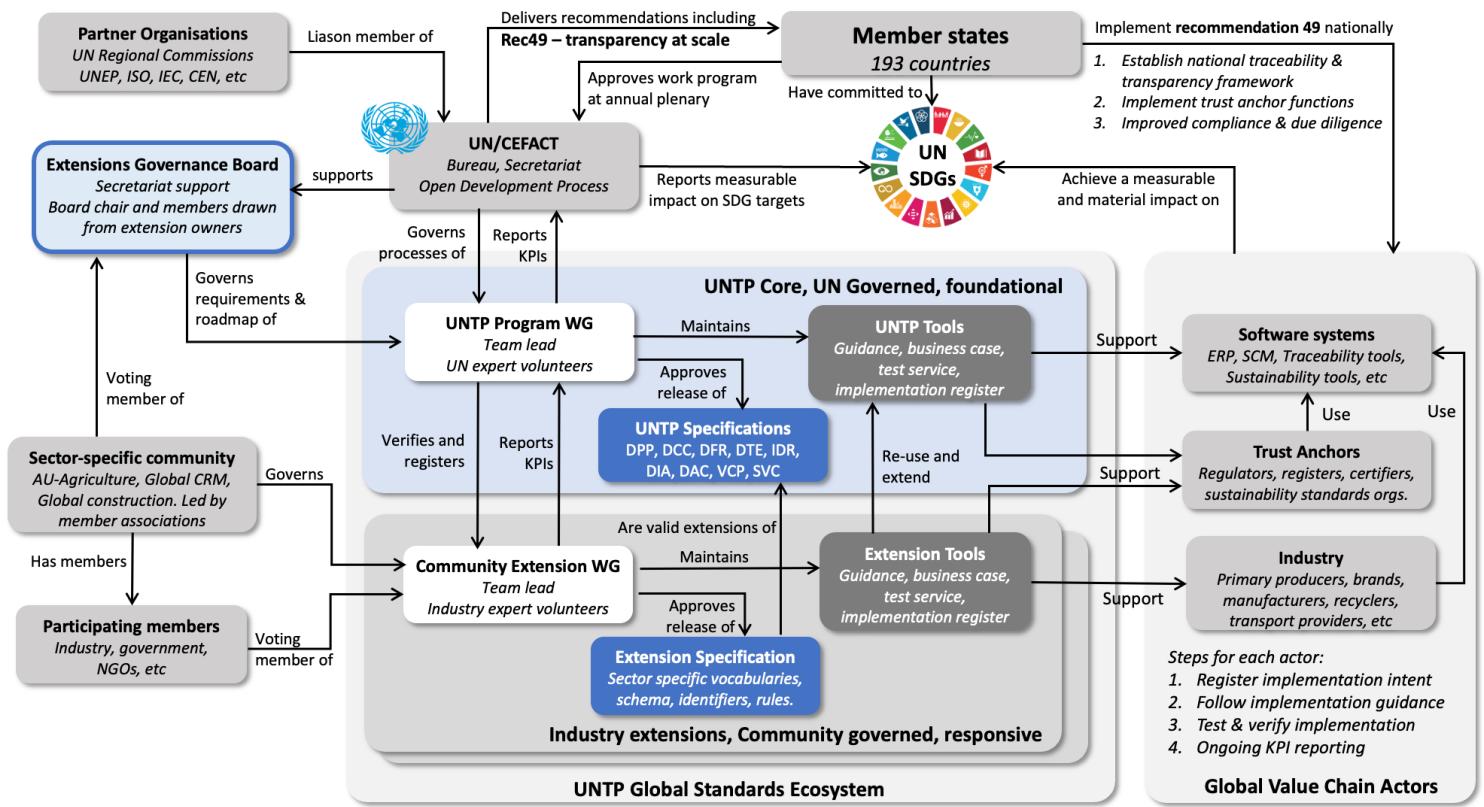
Like all UN/CEFACT standards, the UNTP is a voluntary standard that is not mandated by any regulatory framework. Uptake and implementation will be the result of perceived business value. For this reason, UNTP includes

- Business case templates for [industry](#) and [government](#))to assist implementers with their cost/benefit assessments.
- A [Value Assessment Framework](#) that will collect performance metrics from implementers to track UNTP impact on UN Sustainable Development Goals.
- An [extensions methodology](#) and governance framework that provides an incentive for implementations across entire communities led by member associations.

UNTP aims to be the highest value and lowest cost framework for scaling traceability & transparency across global supply chains.

UNTP Governance Details

UNTP is one program within the overall UN/CEFACT governance framework. The diagram below shows how UNTP and recommendation 49 fit within the global UN/CEFACT governance framework and also specifically how UNTP extensions fit within the UNTP governance framework. Extensions are designed to accommodate industry or geographic specific needs of a specific community of implementers and are typically governed by a member association. To be formally [registered as UNTP extension](#), the extension must also be freely available under a [Creative Commons Attribution 4.0 International license](#) and must be interoperable with UNTP specifications. An extensions governance board who's members include a voting member from each extension provides a means for communities that adopt UNTP to have a say about the roadmap and priorities for UNTP.



The diagram represents the following key governance concepts:

- **UN/CEFACT** comprises a secretariat and an elected bureau and is governed by UN member states which approves the annual program of work and endorses key outputs such as policy recommendations.

- A UNTP **Extensions Governance Board** includes a voting member from each registered UNTP extension and thereby provides a vehicle for collaboration across extensions and for directing the priorities and roadmap for UNTP. It is supported by the UN/CEFACT secretariat.
- The **UNTP Program Working Group** maintains this site and comprises members from UN expert community and sector specific communities. It is governed from a process and quality perspective by the UN/CEFACT bureau. It is also governed by the extensions governance board which sets priorities and roadmap for ongoing UNTP development.
- UNTP comprises a suite of version-managed **technical specifications** as well as some supporting tools that include **implementation guidance**, **business case**, **best practices**, **test services**, and an **implementations register**.
- The **UNTP tools** ensure that implementation is as simple and cost effective as possible and also that implementations are interoperable since all implementations must pass the same test cases.
- UNTP **Community Extensions Working Groups** develop industry and/or geography specific extensions of UNTP following a **methodology** that ensures all extensions remain interoperable with UNTP core implementations and any other industry extension.
- **Extension Specifications** are governed by the community that creates them, usually led by a representative member association. Extensions will typically include sector specific vocabularies, specific credential schema (eg a livestock passport as an extension of a product passport) and specific rules and constraints such as allowed identifier schemes and recognised conformity schemes.
- Extensions must also provide **Extension Tools** including services to ensure interoperability between different implementers of the same extension specification. The generic UNTP test and reference implementation tooling is re-usable for this purpose.
- All implementers that register their system or business on the UNTP website or an extension website are required to provide some basic KPI reporting (eg number of product passports issued) so that performance metrics can be rolled up from implementer to extension community and then up to UN/CEFACT and member states. The performance reporting framework is defined by the UNTP **Value Assessment Framework (VAF)** and is designed to capture quantifiable performance measures that can be mapped to UN **Sustainable Development Goals** and Targets. Anonymised reporting and performance dashboards will be published by the UNTP program.

The diagram shows three classes of implementers within the global value chain.

- **Software systems**, whether commercial or open-source, provide all other implementers with the core technology capability needed to support UNTP. In many cases the underlying software systems supports any industry or geography sector and so would focus on core UNTP conformity, perhaps also supporting some extensions when they have a concentration of customers in a particular industry or geographic sector. UNTP maintains a register of **software system** implementations.
- **Industry actors** such as primary producers, manufacturers, brands, recyclers, transport services, and so on will generally occupy specific industry and geography sectors and so are more likely to be implementers of one or more UNTP extensions. Software systems used by industry actors will generally have implemented core UNTP and will provide some flexibility to configure and support specific rules required by industry and/or geography specific UNTP extensions.
- **Trust anchors** such identity registers would implement core UNTP specifications such as **Identity Resolver** and **Digital Identity Anchor**. UNTP provides certifiers with the opportunity to make their existing product and facility certifications digital and verifiable. Regulators may issue regulatory permits, licenses, and certificates (eg mine permits). Additionally, regulators such as border authorities have the opportunity to automate compliance assessments as verifiers of credentials linked to trade shipments.

UNTP Extension Governance

UNTP extensions for a specific industry and/or geography should be designed and implemented at community level following the [community activation program](#) guidance. This helps to ensure interoperability between members of the community - so, for example, a fabric supplier to multiple fashion brands can implement once for many customers. Consequently there is a need for a governing body to manage the specification development and implementation support on behalf of community members. This task is best suited to existing member associations that already represent the interests of multiple organisations within a sector.

It is tempting to think that the scope of extensions could be governed by UNTP to ensure that there are no overlaps or gaps. However, the real world is not as simple as that and it is inevitable that different communities will overlap. For example a national government critical minerals office may leverage UNTP to create a national traceability and transparency framework in a specific country. At the same time a global member association for a specific mineral (e.g. copper or lithium) may also extend UNTP to support its global members. Some members will inevitably face both. The UNTP governance approach aims to minimise duplication and complexity through visibility.

- By categorising every extension by both country (using ISO country codes) and industry sector (using UN ISIC codes), cases where multiple extensions overlap become visible. Conversely visibility of gaps provides opportunities and incentives for relevant member associations to fill the gaps.
- By requiring that all registered extensions are public and free to use, any communities that find themselves overlapping with an existing industry and/or country sector can see what has already been done and, if appropriate, re-use the existing work without restriction.
- By providing test services to confirm that each extension remains conformant and interoperable with core UNTP, cross-border and cross-industry interoperability is maintained, thereby reducing the impact of differences between overlapping extensions.

UNTP Consensus Driven Development Process

UNTP development follows an agile and iterative approach with maximum public visibility and seeks consensus for each change.

- Anyone can participate as an observer simply by watching development on this UNTP website and by joining the informal chat channel.
- Anyone can formally join the UNTP working group as a contributing member once they have completed the UN/CEFACT [expert registration process](#) which includes formal acceptance of [IPR policy](#).
- Contributing members who wish to propose changes to existing content or contribute new content should [raise a new issue](#) using the GitHub issue workflow - that describes the change. Any other contributing member can comment on the issue. In this way, the issue can be used as a permanent record of working group discussion around the specific issue. Some issues like this one on [identifiers](#) can be long running whilst others like this one on [context file versions](#) can be short and quick to resolve.
- Once the creator of the issue is confident that there has been sufficient exposure and discussion, then a formal request to change content should be lodged - using the GitHub pull request workflow. All pull requests require at least one reviewer to approve the proposed changes and all approved pull requests are discussed at fortnightly meetings. If there are no objections then the changes are merged into the main website. All pull requests [remain visible](#) for public scrutiny.

- If there are objections then they are discussed and, hopefully, resolved with full consensus. In the rare case of objections that cannot be resolved by consensus then meeting chair will hold a vote. A simple majority is required to accept the change.
- All meetings are recorded, transcribed, summarised, and published to the [UNTP meetings](#) page.
- A google group mailing list is also maintained and can be used by any observer or contributing member. All group emails are archived and searchable.

For participants less familiar with GitHub tools and processes, there is a "using GitHub" guidnace page in this section that describes how to write content and how to request changes via the pull request workflow.

UNTP Working Groups Structure

UNTP development and maintenance work is split between four working groups and a steering group.

UNTP Steering Group

Includes membership from each working group described below, ensures overall collaboration and consistency, includes UN secretariat people and coordinates with the proposed extensions governance board and liaises with other DPP initiatives.

Adoption Working Group

Looks after business case and implementation guidance and the promotion / adoption of new implementation commitments by all UNTP implementers including sustainability scheme owners, identity registers, and software platforms. [Terms of reference and meetings](#)

Supply Chain Working Group

Looks after the maintenance of Digital Product Passport (DPP), Digital Facility Record (DFR), and Digital Traceability Events (DTE). These credentials represent the transparent supply chain information. [Terms of reference and meetings](#)

Conformity Working Group

Looks after the maintenance of the Digital Conformity Credential (DCC) and the Sustainability Vocabulary Catalog (SVC). This is all about conformity schemes, and the digitally referenceable criteria that are referenced by DCC assessments and the "Claims" in DPPs and DFRs. [Terms of reference and meetings](#)

Technical Working Group

Looks after the Verifiable Credentials Profile (VCP), Decentralised Access Control (DAC), and Identity Resolver (IDR) specifications. This is all about the technology underpinnings of UNTP. This group would also maintain reference implementation and test suites. [Terms of reference and meetings](#)

Release Management

! INFO

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UNTP Version and Release Management

Within the UNTP business governance framework, there also needs to be some technical governance to ensure quality and stability of UNTP technical deliverables.

Version Management

All UNTP artifacts are rigorously versioned following [semver](#) best practices.

- Version numbers are indicated as a dot-separated triple `{major}.{minor}.{patch}`. For example version 2.3.4.
- `{patch}` version number increments indicate non-breaking bug fixes that do not add new capabilities or features. For example, implementers should see no difference between version 1.4.5 and version 1.4.6.
- `{minor}` version number increments indicate non-breaking enhancements. For example, implementations of version 1.4.5 are still compatible with version 1.5.0 but may not take advantage of new features.
- `{major}` version number increments indicate significant and breaking releases. For example implementations of version 1.5.0 will be incompatible with version 2.0.0 and may fail in unpredictable ways.

Note that 0.x.y versions do not strictly follow semver and may include breaking changes in minor versions. However all versions after 1.0.0 first formal release will strictly observe this versioning process.

Release Management

Every version change is automatically published to the UNTP [test.uncerfact.org/vocabulary](#) end point following a defined URL structure

Linked data vocabulary (test)

- Pattern: <https://test.uncerfact.org/vocabulary/untp/{vocab-name}/{major-version}/{artefact}>
- Example: <https://test.uncerfact.org/vocabulary/untp/dpp/0/product>

Schema and context files (test)

- Pattern: <https://test.uncerfact.org/vocabulary/untp/{credential-type}/{versioned-file-name}>

- Example: <https://test.uncefact.org/vocabulary/untp/dpp/untp-dpp-schema-0.6.0.json>

When a given version meets criteria to justify a production release then the governance process will approve a release that will publish the artefacts to the UNTP `vocabulary.uncefact.org` end point.

Linked data vocabulary (production)

- Pattern : `https://vocabulary.uncefact.org/untp/{vocab-name}/{major-version}/{artefact}`
- Example: `https://vocabulary.uncefact.org/untp/dpp/1/Product`

Schema and context files (production)

- Pattern: `https://vocabulary.uncefact.org/untp/{credential-type}/{versioned-file-name}`
- Example: `https://vocabulary.uncefact.org//untp/dpp/untp-dpp-schema-1.1.0.json`

Steering Group

! INFO

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Terms of Reference

As of 1st July 2025, this UNTP working group will complete its split into four working groups and this group will transition to become a steering group that supports the working groups.

Mailing List

A group mailing list is maintained and can be used by any list member to post messages to the group. The list also maintains an archive of all messages sent to the group.

- To [join the mailing list](#) - your request will be reviewed by a list administrator.

Meetings

UNTP development team meetings are held fortnightly at alternating times to accommodate participants from different timezones. Use the links below to add the calendar entries to your diary or add the meeting links.

- **Thursday 8am UTC Meetings.** Every 4 weeks. Next meeting 10th July 2025.
 - [ICS Calendar File](#). Download and double click to add the meetings to your calendar
 - [Zoom meeting link](#). Click to join the meeting without a calendar entry.
- **Thursday 9pm UTC meetings.** Every 4 weeks. Next meeting 24th July 2025.
 - [ICS Calendar File](#). Download and double click to add the meetings to your calendar.
 - [Join the meeting](#). Click to join the meeting without a calendar entry.

Each meeting will generally work through open [issues](#) and [pull requests](#).

Previous meeting dates, recordings, transcripts, and minutes are summarised below with the most recent meeting at the top.

Previous Meetings

Meeting	Summary	Recording	Transcription
2025-06-26	The UNTP steering group discussed preparations for the upcoming Geneva plenary and Recommendation 49 approval, addressed mailing list and meeting coordination issues, reviewed subgroup progress, and explored governance for future UNTP extensions and interoperability.	video	transcript
2025-06-12	The UNTP meeting formalized four new working groups—Conformity, Product Passports, Adoption, and Technical—to advance implementation readiness ahead of the upcoming UN plenary, with subgroup leads outlining plans and new collaborations announced with GBA, ITC, and VC4Trade.	video	transcript
2025-05-29	The UNTP Working Group discussed copper supply chain traceability challenges, mass balance and book-and-claim models, credential mapping within UNTP, and previewed Tier 3 testing for verifying relationships between multiple verifiable credentials.	video	transcript
2025-05-14	The UNTP Technical Working Group reviewed and approved schema updates, demonstrated a new validation and mutual verification testing pipeline, discussed data model interoperability across ecosystems like GS1, and prepared for the upcoming 0.6 release with contributions from new and returning participants.	video	transcript
2025-04-17	The UNTP team met to discuss updates on Recommendation 49, roadmap milestones, pilot project planning across sectors, subgroup formation, and key terminology and data structure decisions, welcoming several new participants to the initiative.	video	transcript
2025-04-03	The UNTP working group, led by Steve and Brett, reviewed draft terms of reference for subgroups and introduced a proposed Sustainability Vocabulary Catalog to standardize and digitize conformity criteria, while participants raised concerns around governance, classification, and AI integration.	video	transcript
2025-03-20	The UNTP meeting focused on strengthening governance, introducing subcommittees for scalability, and advancing work on a machine-readable sustainability criteria catalog to support digital product passports.	video	transcript
2025-03-06	The meeting covered updates on GS1's commitment, improvements to the information architecture, the UNTP Playground's credential validation	video	transcript

Meeting	Summary	Recording	Transcription
	features, and a discussion on whether bulk materials require a separate Digital Material Passport, concluding that further testing is needed.		
2025-02-20	The meeting focused on preparing UNTP for public review, addressing governance, simplifying specifications, improving usability, and ensuring alignment with Recommendation 49 while planning for future pilots and implementations.	video	transcript
2025-02-06	The UNTP meeting focused on reviewing change requests, refining the identity resolver framework, approving the verifiable credentials update, discussing implementation guidance, exploring certification and governance models, and addressing open issues for future development.	video	transcript
2025-01-23	The meeting focused on enhancing UNTP governance, fostering community engagement through CAP, refining chain of custody models, and exploring tools for effective collaboration, setting the stage for further iterations and sector-specific applications.	video	transcript
2025-01-08	The meeting addressed progress on UNTP implementations, focusing on decentralized access control, sustainable mining, and selective disclosure, while initiating discussions on managing mixed commodities and advancing public review of specifications.	video	transcript
2024-12-12	The meeting discussed progress on UNTP collaborations, technical updates, and pilot projects, with participants emphasizing interoperability, schema flexibility, and industry-specific implementations for 2025 goals.	video	transcript
2024-11-28	The meeting underscored the progress in developing agricultural extensions for UNTP, the usability of tools like the playground, and the importance of addressing business challenges alongside technical ones.	transcript	video
2024-11-14	The UNTP working group discussed recent industry commitments, advanced business case documentation, and proposed a community-driven testing support ecosystem to enhance UNTP implementation and interoperability.	video	transcript
2024-10-31	The team discussed updates on UNTP governance, digital product passport collaborations, and the methodology for industry-specific extensions, focusing on security, visibility, and implementation compliance.	video	transcript
2024-10-17	The team discussed the latest updates on UNTP credential implementation, focusing on testing, identity resolution processes, and potential trust anchors for bulk commodity tracking.	video	transcript

Meeting	Summary	Recording	Transcription
2024-10-03	The meeting focused on reviewing and refining the business case content for Digital Product Passport implementation, addressing technical bugs, and preparing the materials for broader feedback and publication.	video	transcript
2024-09-19	The meeting focused on reviewing new registration requests, addressing syntax and human-readability issues in traceability events, planning updates to the REC 49 policy document, and discussing business case development for public and private sector value.	video	transcript
2024-09-11	The meeting covered updates on standards integration, implementation commitments from key stakeholders like the British Columbia government, and the plan to freeze UNTP version 0.4.0 for upcoming pilot programs.	video	transcript
2024-09-05	The meeting focused on updates and discussions around the development of a global digital product passport, business case frameworks, and the importance of community activation in implementing UNTP extensions.	video	transcript
2024-08-28	The meeting focused on updates and discussions around the development of a global digital product passport, business case frameworks, and the importance of community activation in implementing UNTP extensions.	video	transcript
2024-08-22	The meeting focused on refining the business case content, updating the digital product passport schema, and preparing to solicit implementation commitments as the team moves towards a stable 1.0 release by the end of the year.	video	transcript
2024-08-15	The meeting focused on refining digital product passports, facility records, and conformity assessment schemes while establishing a working group to develop the business case pages.	video	transcript
2024-08-01	The meeting focused on refining the business case for the UNTP, discussing the inclusion of emissions and circularity performance in digital product passports, and balancing simplicity with the need for reliable data to encourage voluntary adoption.	video	transcript
2024-07-25	The meeting focused on updates from recent presentations in Geneva, a planned demo on TrustGraphs, reviews of multiple pull requests, discussions on various issues including human observations as sensors, and setting action items for updating digital product passport pages and creating a glossary for standards and acronyms.	video	transcript

Meeting	Summary	Recording	Transcription
2024-07-17	The meeting discussed integrating business experts, collaboration with CENELEC on global standards, and reviewing a significant pull request to enhance data model consistency and governance.	video	transcript
2024-07-04	The meeting focused on reviewing PRs for digital product passports, discussing the integration of JSON-LD and JSON Schema for transparency graphs, and planning next steps for refining and testing the models.	video	transcript
2024-06-27	The meeting focused on reviewing and addressing public comments on Recommendation 49, planning the consolidation of these comments over the weekend, introducing a new digital identity anchor credential, and discussing the governance and versioning of standards.)	video	transcript
2024-06-19	The meeting focused on aligning implementation tools and conformity credentials with VCDM, renaming digital link resolver to identity resolver, restructuring the site, and discussing the use of the Jargon tool for generating context files.	video	transcript
2024-06-13	TThe meeting focused on reviewing and merging key pull requests, discussing the UNTP architecture and methodology, and planning actions for schema and context file alignment.	video	transcript
2024-06-05	The meeting focused on improving meeting participation, managing transcription and summary processes, handling JSON schema and JSON-LD context differences, addressing challenges with semantic interoperability, and establishing principles for managing context files.	video	transcript
2024-05-30	The meeting focused on addressing pull requests, aligning with EU right-to-repair regulations, and discussing the challenges and strategies for maintaining and verifying digital product passports within the supply chain.	video	transcript
2024-05-23	The Working Group discussed updates to the digital product passport sample file, terminology adjustments, and the adoption of a "transparency graph" to better align with the VC data model and enhance data validation and provenance.	video	transcript
2024-05-16	In the meeting, the team discussed updates to project examples and data models, alignment with international standards, and strategies for maintaining interoperability and accurate mappings in linked data while preparing for upcoming pilot implementations.	video	transcript

Meeting	Summary	Recording	Transcription
2024-05-09	The meeting focused on aligning digital product passport models with the VC data model, removing scoring elements to simplify the structure, and discussing the implementation of trust graphs and multilingual support using governed overlays.	video	transcript
2024-04-25	The meeting focused on reviewing and processing pull requests, assigning stale issues, and emphasizing broader collaboration within the group, with key discussions on traceability event schema updates and the verification of identifiers.	video	transcript
2024-04-18	The April 18, 2024, meeting focused on streamlining specification sections, reviewing and merging several pull requests, and discussing key issues related to verification and trust graphs, with commitments to create examples and improve meeting efficiency.	video	transcript
2024-04-11	The meeting focused on discussing industry use cases for the Digital Product Passport, trust and credential verification methods, and agreeing on future tasks and pilot projects, with an emphasis on more active use of Slack for ongoing discussions.)	video	transcript
2024-04-04	The meeting focused on refining digital product passports and verifiable credentials, emphasizing interoperability, traceability, and the development of clear business requirements to guide technical decisions.	video	transcript
2024-03-28	The meeting focused on discussing and refining the digital product passport (DPP) structure, addressing the challenges of integrating claims and evidence at different levels, and planning further updates and reviews to ensure its practical implementation.	video	transcript
2024-03-14	The team discussed the successful submission of the policy document, agreed on weekly meetings, reviewed technical specifications and PRs, and demonstrated GitHub contribution processes.	video	transcript
2024-02-29	The team discussed updates from Europe, aligned on the structure of recommendations and challenges in their document, and set a plan for finalizing the document for submission by the end of the week.	video	transcript
2024-02-15	The meeting focused on refining the policy document draft by incorporating feedback, simplifying technical language, and aligning with global frameworks to prepare for final review and public release.	video	transcript

Meeting	Summary	Recording	Transcription
2024-02-01	The meeting focused on refining the structure and content of the policy document, discussing the sustainability pledge, addressing collaboration challenges in value chains, and planning the next steps for finalizing the draft for public consultation.	video	transcript
2024-01-25	The meeting focused on refining the structure and content of the policy document, discussing the sustainability pledge, addressing collaboration challenges in value chains, and planning the next steps for finalizing the draft for public consultation.	video	transcript
2024-01-18	The meeting focused on reviewing GitHub issues, demonstrating verifier experiences, discussing schema context, developing a sustainability vocabulary, handling versioning and implementation profiles, and planning for industry-specific extensions of UNTP.	video	transcript
2024-01-11	The meeting focused on reviewing the registration status, introducing the structure of the GitHub repository for technical specifications, discussing key sections and their alignment with existing standards, and planning to split into separate technical and policy teams for focused work.	video	transcript
2023-12-14	The meeting focused on revising the structure of Recommendation 49, enhancing communication strategies, inviting contributions, and planning technical content development for implementation, with follow-up actions and scheduling outlined.	video	transcript
2023-11-30	The meeting focused on refining communication strategies and restructuring Recommendation 49 to align with previous UN recommendations, emphasizing flexibility, implementability, and stakeholder engagement.	video	transcript

2025-06-26 Meeting Summary

Date: 26 June 2025 **Location:** Virtual (Zoom) **Chair:** Steve Capell

Attendees

(Note: list inferred from transcript; not all full names were captured)

- Steve Capell (Chair, UNTP)
- Nancy (UN/UNCEFACT Chair)
- Brett (Conformance Group Lead)

- Michael (Adoption Group Lead)
- Nick (Supply Chain Implementation Group Lead)
- Zach (Technical Contributor)
- Gideon (ISOCASCO/Conformity Assessment)
- Brie
- Finn
- Will Nixon (Australia)
- Additional unnamed participants from Canada, Austria/Ireland, UK, US

Key Discussion Points

1. Attendance and Mailing List Confusion

- Lower than usual turnout (~10 vs expected 20) due to mailing list transition from Google Groups to Gaggle.
- Meeting invites likely ended up in participants' junk folders.
- Calendar issues also noted due to time zone shifts; Steve committed to clarifying on the website and via direct email.

2. Upcoming Geneva Events

- UNCEFACT Plenary (2-day) to review work plan including sustainability and UNTP.
- Recommendation 49 ("Transparency at Scale") is up for approval.
- UNECE is hosting several digital product passport (DPP) events in batteries, textiles, etc.
- Open Wallet Foundation hosting an in-person-only event on decentralized identity; UN is a co-organizer.

3. Status of Recommendation 49

- Nancy reported growing support, especially after her presentation at UN Open Source Week.
- Only notable concern from Germany, requesting either removal or modification of annex referencing UNTP.
- Language is being negotiated to reach consensus.
- Support letters to national Heads of Delegation from experts are encouraged.

4. UNTP Extension Framework

- Global Battery Alliance has formally requested to lead a battery-specific UNTP extension.
- A governance framework for extenders is being developed; first meeting in Geneva.
- Discussion on when and how extenders gain influence on UNTP core.

5. Governance and Interoperability

- Need for consistent criteria across different schemes (e.g., carbon measurement, conformance).
- Two interoperability concerns: data schema and scheme comparability.
- Gideon emphasized the importance of early alignment with global conformity assessment frameworks.

6. Working Group Updates

Conformance Group (Lead: Brett)

- 37 members; kickoff meeting scheduled for 15 July.
- Aligning with ISO/CASCO to avoid redundancy.

Adoption Group (Lead: Michael)

- First call held; lower attendance possibly due to timing and link confusion.
- 15 members on the list.
- Planning next meeting and stakeholder assignments.

Supply Chain Implementation Group (Lead: Nick)

- 8 members actively engaged.
- Draft terms of reference reviewed.
- Focus on real-world DPP implementations, capturing lessons learned, and data mapping.

7. Technical Update

- Awaiting lead.
- Playground testing tool being upgraded to support linked verifiable credentials.
- V0.6 release now available for pilot implementations.
- Discussion on possibly migrating key technical components (e.g., digital identity anchor spec) to broader UN projects like Global Trust Registry and VC for Trade.

8. Blockchain Feedback

- Feedback received requesting softer language regarding blockchain use in the verifiable credentials profile.
- Agreed to revise wording with care to remain inclusive but avoid platform bias.

9. Transparency and Documentation

- Agreement that subgroups should publish meeting summaries and optionally transcripts.
- GitHub tickets tagged by group are to be used for cross-group visibility and coordination.

Action Items

- **Steve:**

- Send direct email (not via Gaggle) to clarify mailing list and meeting details.
- Update meeting time on website.
- Follow up with heads of delegation contacts for letter-writing support.
- Add Brett and Michael to the Extenders Group Geneva meeting.

- **Working Group Leads:**

- Publish meeting summaries on their respective UNTP pages.
- Encourage issue tracking and cross-tagging in GitHub.

- **Participants:**

- Review Recommendation 49 and consider writing support letters to heads of delegation.

2025-06-12 Meeting Summary

Date: 12 June 2025 **Recording:** Publicly available **Chair:** Steve Capell

Participants

- Steve Capell (Chair)
- Brett Hyland (Conformity Group Lead)
- Michael Shea (Adoption Group Lead)
- Nick P (Product Passport Group Lead)
- Nis Jespersen (VC4Trade Initiative)
- Suzanne (Technical Contributor)
- Zach Seuss (Technical Editor for Conformity and Adoption Groups)
- Phil (noted in discussion)
- Other participants not individually named in transcript

Summary of Contributions

Opening Remarks – Steve Capell

- Welcomed attendees and introduced new structure: four subgroups (Conformity, Product/Facility, Adoption, Technical).
- Updated the group on UNTP progress:
 - Preparation underway for UN plenary (early July); lobbying to ensure RET49 passes without objection.
 - Participation in global events such as the Open Wallet Foundation's collaboration summit.
 - Coordination with Global Battery Alliance (GBA) and CatenaX to develop battery-specific UNTP extensions.
 - Collaboration with the International Trade Centre (ITC) for tooling to support SMEs using UNTP.
- Apologized for the delay in publishing subgroup infrastructure on GitHub but committed to submitting a pull request the next day.

Brett Hyland – Conformity Working Group

- Outlined the purpose of the group: ensuring credibility of voluntary sustainability claims through recognized conformity assessment processes.

- Described the role of ISO/CASCO and WTO obligations for verified compliance.
- Highlighted legacy work under UN CFACT and its evolution into the new working group.
- Shared primary deliverables:
 - Digital Conformity Credential (DCC) specification.
 - Sustainability Vocabulary Catalogue (SVC).
- 26 people have expressed interest; first meeting to be scheduled soon.
- Zach Seuss to serve as technical editor.

Michael Shea – Adoption Working Group

- Role of the group: develop business case for UNTP, increase uptake, and support implementers.
- Meetings will occur fortnightly on alternating time zones to cover global participation.
- Goals include:
 - Finalizing business case content.
 - Drafting letter of intent templates for implementers/extenders.
 - Providing outreach and training resources.
 - Clarifying UNTP's complementarity with EU, ISO, IEEE, and ITU standards.
- Active Slack channel renamed for the group; participants invited via Slack or email.

Nick P – Product Passport & Facility Record Working Group

- Focus on practical application of DPPs (Digital Product Passports), DFRs (Facility Records), and DTEs.
- Brought an industrial and ESG manager perspective to the effort.
- Emphasized harmonizing existing disclosure requirements using the DPP as a common carrier.
- Group will explore selective disclosure and re-use of existing DPP content across frameworks like CSRD and EUDR.
- Encouraged participation from technical experts to support the group's efforts.

Steve Capell – Technical Working Group (interim lead)

- Covers maintenance of:
 - UNTP's Verifiable Credentials profile.
 - Identity resolver and access control.
 - Test suites and schema validation tools.
- Version 0.6 of the technical artifacts is nearly ready and addresses prior semantic and JSON-LD issues.
- Group lead still to be confirmed.

Nis Jespersen – VC4Trade Initiative

- Introduced new project to apply UNTP architecture to traditional trade documents (e.g. invoices, bills of lading).
- Based on ICC KTDDE data models; aims to improve trade document interoperability with verifiable credentials.
- Project will coordinate with ICC DSI and UNECE.

Additional Comments

- Brett raised concern over ICC parent organization's policy brief potentially overlapping UNTP without acknowledgment.
- Nick noted possible carbon-related duplications in ICC efforts and flagged for subgroup attention.
- Suzanne raised a GitHub permission issue, which Steve will investigate.

Action Items

Task	Responsible	Deadline
Submit GitHub PR to establish subgroup pages and signup mechanisms	Steve Capell	13 June 2025
Finalize and publish Conformity Group kickoff schedule	Brett Hyland	Mid-June 2025
Promote Adoption WG on LinkedIn and begin first working session	Michael Shea	26 June 2025
Confirm technical lead for Technical WG	Steve Capell	ASAP
Resolve GitHub permission issue for Suzanne	Steve Capell	ASAP
VC4Trade project to finalize mailing lists and meeting structure	Nis Jespersen	TBD
Review ICC "Data Flows in Supply Chains" paper for overlap	Brett/Nick	TBD

2025-05-29 Meeting Summary

UNTP Working Group – Meeting Summary Date: 29 May 2025 **Chair:** Steve Capell **Recording:** Confirmed, to be published
Session Type: Technical status meeting

Participants (Named)

- **Steve Capell** – Chair, presented chain of custody models and led discussion
- **Phil Archer** – Provided update on IANA registration for DPP link relation type
- **Nancy Norris** – Chair of the UNCFACt Bureau; described UNCFACt's oversight and copper industry interest
- **Nick Smith** – Commented on mass balance, government-linked registries, and emissions data aggregation
- **Michael** – Presented Tier 3 testing proof of concept for credential trust graphs

- **Adriana** – Raised questions on access control and data visibility for traders
- **Ali (Canada)** – Described practical implementation of mass balance in mining operations
- **Brett** – Asked about access to Tier 3 testing tools
- **Other noted speakers:** Zach (mentioned), Jordan, and unnamed participants from Surpass and other affiliated organizations

Key Topics Discussed

1. IANA Link Relation Registration

- Phil is registering "dpp" as an IANA link relation type.
- UNTP will be cited as the primary reference, with an equivalence note to GS1's DPP.
- The working group agreed with the proposed short, precise definition.

2. Chain of Custody in Copper Supply Chain

- Steve presented a multi-step diagram from mine to EV recycling, explaining transformation from ore to concentrate, blister, cathodes, and manufactured goods.
- Discussion focused on identity, traceability, and batch blending complexities—especially where smelters/refiners mix inputs from multiple sources.

3. Mass Balance and Guarantee of Origin

- Mass balance models were discussed as key mechanisms to trace sustainability attributes through mixed material flows.
- The need for quota management and assurance was emphasized, with commentary from Nick and Ali on real-world practices in Australia and Canada.
- Nancy noted that Coppermark and IRMA already audit chain-of-custody systems rather than individual transactions.

4. Trading and Obfuscation

- Traders often redact source identities due to commercial sensitivities.
- Adriana and others discussed access control solutions using UNTP's decentralized access model.
- Quality assurance requirements in sectors like defense and aerospace were noted as potential drivers for full traceability.

5. Book and Claim Models

- Explored as complementary to traceability, particularly when traceability is impractical or cost-prohibitive.
- Nancy and Nick highlighted their utility in incentivizing sustainability improvements at the source.
- Discussion raised the issue of potential double counting and the role of registry programs in preventing it.

6. UNTP Mapping

- Steve proposed that guarantees of origin be treated as digital conformity credentials (DCCs), and stock/flow data as traceability events (DTEs).
- The group generally agreed this was a practical mapping to UNTP concepts.

7. Tier 3 Testing Demo

- Michael demonstrated a CLI-based proof of concept that builds a trust graph from verifiable credentials and their relationships.
- Key functionality included JSON-LD parsing, schema validation, issuer trust chain verification, and semantic inference.
- Planned future integration with the UNTP Playground and improvements in visualization were discussed.
- GitHub repo was shared for early testing and contributions.

Outcomes and Next Steps

- Update the UNTP chain of custody page to include mass balance and book-and-claim explanations, with diagrams and credential mappings.
- Continue development of Tier 3 testing features and integrate into UNTP Playground.
- Reach out to Phil and Michael for offline collaboration on IANA registration and testing framework, respectively.
- Schedule next meetings targeted for European time zones, with ongoing discussions to continue online.

2025-05-14 Meeting Summary

UNTP Technical Working Group – Meeting Summary Date: 14 May 2025 **Chair:** Zach **Host:** Zach **Recording:** Confirmed to be active, potentially recorded to Zach's Zoom cloud

Participants (Named)

- **Zach** – Facilitator, led discussion on governance, PRs, and technical updates
- **Ash** – Demonstrated the new data model validation and mutual verification testing processes
- **Phil Archer** – Provided feedback on testing and verification; discussed GS1 identifier systems
- **Alex (Checked)** – Introduced interest in DID-based trust registries and UNTP contributions
- **Christophe (Queer Factum)** – Joined as a contributor to DPP-related work, not representing GTC24
- **Nabil Ahmed (Circularize)** – Observing UNTP developments due to alignment with traceability goals
- **Unnamed expert from Cirpice2 / Impact** – Introduced herself as a first-time participant, working on traceability in the fashion sector
- **Adriana** – Mentioned being assigned a task by Steve but unable to locate it
- **Jordan** – Provided technical validation feedback and support for Ash's demo
- **Nick Smith** – Asked questions about validation pipeline context and real-world change examples
- **Stefano** – Mentioned in the list of open GitHub tickets
- **Michael** – Collaborated on addressing schema validation issues (mentioned by Ash)

Key Topics and Discussions

1. Meeting Opener and Introductions

- Zach emphasized that the meeting follows the UN Open Development process.
- New participants introduced themselves, notably from Europe, fashion, and the Circularize traceability platform.

2. Pull Request Reviews

- Zach reviewed PR #43 concerning updates to FAQs on DPP topics like late data and repair events.
- Ash approved and merged the PR with no objections.
- Plan: remaining PRs to be reviewed by participants post-meeting; objections must be submitted by week's end.

3. Jargon Release and Validation Pipeline

- Ash presented the new validation workflow:
 - Snapshots now trigger schema and context validation pipelines.
 - Errors caught pre-release instead of post-release.
 - Includes JSON-LD expansion and schema conformance checks.
- The process reduces error rates and increases community collaboration.
- Human review remains critical for semantic accuracy.
- Future improvement: enforce check statuses to block PR merges until validations pass.

4. Mutual Verification Testing Demo

- Ash presented the UNTP Playground tool:
 - Supports mutual verification for VCs against UNTP schema and VCDM.
 - Users upload their own VCs and verify others' to prove interoperability.
- Documentation now explains Tier 1 and Tier 2 testing stages.
- W3C VCDM v2 test suite was found insufficient; custom mutual verification is used for now.

5. Discussion on Data Model Interoperability

- Phil raised concerns about overlapping verification logic across different ecosystems (e.g., existing global identifier schemes vs UNTP).
- Zach explained Tier 1 (technical VC compliance), Tier 2 (schema-level), and Tier 3 (cross-credential trust graph) validations.
- Alex emphasized the future role of global trust registries in resolving schema equivalence and issuer accreditation.

6. Open Issues and Next Steps

- Zach reviewed the GitHub issues list for the 0.6 release and reminded participants to address their assignments.
- Phil confirmed recent contributions and encouraged peer review of IDR-related spec additions.
- Adriana will follow up with Steve to confirm her assigned task.

7. FIWARE DPP Announcement

- A participant shared that they will be presenting UNTP at the FIWARE Global Summit in Morocco, focusing on Open DPP frameworks for SMEs and smart city applications.

Next Steps

- Review and comment on current open pull requests before end of week.
- Prepare for next session where Tier 3 testing and trust graph validation will be showcased.
- Steve to follow up with Adriana on task assignment.
- Continue collaboration on global trust registries and identity scheme integration.

2025-04-17 Meeting Summary

Facilitator: Steve Capell (Speaker 1)

Duration: Approximately 1 hour

Recording: Yes, available publicly

Purpose: Regular UNTP team meeting covering updates, new participants, recommendation development, roadmap planning, pilots, and discussion of issues.

Key Participants

- **Steve Capell** – Lead facilitator, overseeing agenda and project direction
- **Matthias Altmann** – Consultant joining UNECE Secretariat, working on traceability projects
- **Virginia (Speaker 14)** – Participant recovering from illness
- **David (Speaker 10)** – New participant from GraphVise, interested in DBPs
- **Eric Drury (Speaker 11)** – Independent consultant in digital identity and trust
- **Adriana (Speaker 7)** – Contributor with a focus on circular performance
- **Michael (Speaker 5)** – Involved in DPP, IEEE, and regulatory frameworks
- **Suna (Speaker 4)** – Provided input on upcoming EU regulations
- **Peter (Speaker 6)** – Raised points about GS1 and upstream supply chains
- **Christophe (Speaker 9)** – Commented on DPP terminology and structure

Discussion Highlights

1. Introductions & Participation

- Welcomed newcomers: Matthias Altmann, David, and Eric Drury.
- Updates from returning members, including Virginia's recovery.

2. Administrative Notes

- Clarified meeting recording and IP contributions for UNTP participation.
- Addressed time zone confusion due to daylight savings.
- Group agreed to continue meetings at 8 a.m. UTC.

3. UNTP and Recommendation 49

- Steve provided updates on **Recommendation 49 (Transparency at Scale)**:

- Separated implementation guidance into **design principles**.
- UNTP positioned in the annex as one of several supporting instruments.
- Diagram introduced to explain framework lifecycle generically.

4. Roadmap Planning

- Current version: **0.5**; goals set for versions 0.6, 0.7, and 1.0.
- 0.6: Technical fixes.
- 0.7: Incorporate business functions and feedback.
- 1.0: Stable release planned for fall 2025.
- Steve encouraged tagging issues in GitHub with target versions.

5. Subgroups Formation

- Announced the formation of subgroups:
 - **Conformity Subgroup** (lead: Brett)
 - **Adoption Subgroup** (lead: Michael)
- Two more subgroups in planning; volunteers still needed.
- Plan to spin off groups as soon as leads are ready.

6. Pilots and Testing

- **Steve** detailed the **Responsible Business Alliance (RBA)** pilot in electronics and automotive.
- **Matthias** discussed pilots in **garments** and **critical raw materials (starting with copper)**:
 - Aim to demonstrate **scalability and interoperability**.
 - EU project funding supports pilot facilitation.
- Additional pilot opportunities:
 - **Tire industry** (Michael & Adriana to explore GDSO involvement)
 - Collaboration with **Surpass Initiative** and European **data spaces**.
 - Alignment with **Gaia-X / Catena-X**.

7. Open Issues & Feedback

- Terminology:
 - Discussion on continuing to use "**DPP (Digital Product Passport)**" vs. "product data."
 - Consensus: Retain "DPP" with clear guidance on voluntary vs. regulatory use.
- Data Structure:
 - Discussion on **flattened vs. hierarchical** conformity structures.
 - Tendency toward flat for simplicity, but open to structured representation.
- Naming clarity:
 - Debate on whether to rename **Digital Conformity Credential** to **Attestation**.
- Schema usage:
 - Reviewed use of **schema.org** and **semantic context files**.
 - Issues raised about schema.org inheritance quirks (e.g., "drive-thru" countries).

Action Items

- Participants to **review and comment on GitHub issues**.
- Volunteers needed to lead additional subgroups.
- **Adriana** to raise circular performance concerns via GitHub.
- **Matthias** to document pilot progress and stakeholder coordination.
- **Michael** and team to explore tire industry and DPP regulations.
- Further exploration of **schema.org compatibility** in the UNTP model.

2025-04-03 Meeting Summary

Meeting Summary

Date: April 3, 2025

Topic: UNTP Working Group Meeting

Duration: ~1 hour

Recorded & Transcribed: Yes

Chair: Steve

Agenda

1. Review of draft Terms of Reference (ToR) for working groups (led by Brett)
2. Presentation of the draft **Sustainability Vocabulary Catalog** specification (by Steve)
3. Open discussion on governance, classification schemes, and next steps

Participants

There were 20 participants with contributions as described below.

Name	Role/Notes
Steve	Chair, presenter of UNTP structure and Sustainability Vocabulary Catalog
Brett	Lead of Conformity Credential Group, drafted ToR
Virginia	Contributor, raised key concerns on roles, classification, AI usage
Zach	Provided strategic input, supported linking previous conformity work
Bree	Asked governance and extension implementation questions
Phil	Aligned current work with machine-readable credentialing

Name	Role/Notes
Clary	Inquired about handling activities, mitigation risks, registry process
Nick	Cautioned about overreach and subjectivity in standards
Robertus	Advocated clarity for new readers, suggested keeping helpful visuals
Marcus	Asked about URIs and issues with paywalls
Michael	Inquired about EU regulations like CSRD/CSDDD

Key Discussion Highlights

1. Working Group Terms of Reference

- **Brett** presented a draft ToR for the Conformity Credential Group.
- Roles proposed: **Group Lead, Technical Editor**, possibly additional roles (e.g. Register Maintainer).
- Feedback:
 - **Virginia**: Watch for workload — suggested splitting tasks.
 - **Phil/Zach**: Tie-in with UNCFACCT and earlier conformity projects.
 - **Robertus**: Asked for acronym clarity and onboarding support.
- Consensus: Keep the ToR flexible and evolving.

2. Sustainability Vocabulary Catalog (SVC) Draft

- **Steve** walked through a proposed model for scheme owners to:
 - Publish digitally referenceable criteria.
 - Be included in a **scheme register**.
 - Classify criteria using a controlled vocabulary.

Key features:

- Clear distinction between **self-claims** (Digital Product Passports) and **third-party audits** (Conformity Credentials).
- Encourages scheme owners to publish **granular, URI-addressable criteria**.
- Optional fields for scores, thresholds, and measurement types.

3. Classification Concerns

- Proposed a 2-level classification model inspired by OECD, ESPR, ITC, etc.
- **Virginia**: Urged coordination with ITC; pointed out their taxonomy and data should be consulted.
- **Clary**: Raised concerns around registering mitigation activities.
- **Michael**: Suggested alignment with CSRD, CSDDD.

- **Marcus:** Asked how the model handles URIs behind paywalls (e.g. ISO).
-

AI and Automation Debate

- **Nick & Phil:** Cautioned against overreliance on AI for standards mapping.
 - **Steve:** Clarified AI references were exploratory and not core.
 - **Virginia & Zach:** Suggested AI-related notes should be relocated to adoption/business case docs.
 - **Consensus:** Remove “AI” terminology from spec and refer to “Assessment Assistance Tools”.
-

Next Steps

- **Steve** to update the SVC draft:
 - Remove direct AI references.
 - Reframe visuals for clarity.
 - Publish revised draft for peer review.
- Plan to **formally initiate sub-working groups** based on ToRs in the coming weeks.
- Consider organizing a **joint discussion** with ITC to align classification vocabularies.

2025-03-20 Meeting Summary

Date: March 20, 2025

Project: United Nations Transparency Project (UNTP)

Facilitator: Steve (Speaker 1)

Recording Note: Meeting was recorded and will be posted.

Participants & Introductions

- **Steve** (Facilitator): Based in Canberra, Australia. Emphasized the need for better governance and decentralization.
- **Herman van der Pooy:** From FIDES (Netherlands). Introduced his colleague Victor van der Hulst. Interested in UNTP, especially discovery based on decentralized identifiers and invoicing.
- **Daria:** Starting April 1 as Chief Sustainability Officer at Ressos, a metals traceability company. Based in Germany.
- **David Jensen:** From UN Environment Programme. Focused on environmental aspects of digital transformation. Interested in overlap with UNEP's Digital Product Passport blueprint.
- **Marcus:** Working with local agriculture and seaweed production communities. Raised points about innovation at grassroots levels.
- **Phil Archer:** Advocated for better semantic mappings and URI-based standards for sustainability criteria.
- **Michael:** Raised governance questions and proposed aligning with open source governance models (e.g., Linux). Volunteered to help with business case documentation.
- **Adriana:** Proposed forming sub-working groups, including one on standards. Shared her experience analyzing sustainability standards for SERPAS.
- **Nick:** Suggested a matrix structure—subgroups by sector and technical focus—for scalability.

- **Zach**: Supported subcommittees and emphasized the need for leadership and community contribution to make the UNTP sustainable.
- **Bertus, John**, and several others also participated actively.

Key Discussion Points

1. Governance Update

- Steve admitted to bypassing the formal GitHub process when making a governance diagram change.
- Proposal to transfer the GitHub repository ownership to the UN Secretariat to enforce governance practices.
- **New Governance Addition**: An “Extensions Governance Board” was added to give extension owners formal input into core UNTP development.

2. Subcommittees Proposal

- General agreement on forming subcommittees to decentralize and scale work.
- Possible structure:
 - By **technical components** (e.g., identity, traceability, resolver)
 - By **industry sectors** (e.g., agriculture, mining, electronics)
- Steve will propose a structure and seek feedback via email.

3. Standards Integration

- UNTP will act as a global open standard and complement JTC24 (EU's DPP regulation body).
- TC154's Joint Working Group 9 (UN/ISO collaboration) was cited as a global standardization path.
- Emphasis on how UNTP differs by not dictating centralized registries and allowing for decentralized implementations.

4. Sustainability Vocabulary Catalog (New Work Item)

- The team is developing a way to make sustainability-related **criteria URI-addressable and machine-readable**.
- Key challenges:
 - Different schemes (e.g., IRMA, TSM) define sustainability criteria differently.
 - Need a referenceable taxonomy for these criteria.
 - Determine whether referencing should be a “must” or “should”.
- General support for the effort. Recognized as **critical for data credibility and interoperability**.

Next Steps & Action Items

- **Steve** to draft a proposal for working group structure.
- **Team** to provide feedback on subcommittee structure and volunteer for leadership.
- **Sustainability Vocabulary Work**: Continue researching schemes and URIs. Draft guidance for scheme owners on publishing machine-readable criteria.
- **Michael** to resume work on business case documentation.
- Update diagrams to reflect **facility records** as a core component.

2025-03-06 Meeting Summary

Chair: Steve

Attendees: Nick, Zach, Alberto Spritorius, Ali Bezirizadeh, Peter, Patrick, Danika, Ashley, Adrian, Albertus, and other contributors

1. Welcome and Introductions

- **Steve** welcomed attendees and acknowledged voluntary participation.
- **Alberto Spritorius** (Tuneas International) introduced himself, explaining his background in vehicle license plate manufacturing and standards.
- **Ali Bezirizadeh** (AI Simpro, Canada) introduced his work on bulk material traceability in the mining sector.

2. GS1 Commitment to UNTP

- **Steve** announced GS1's commitment to implementing the UNTP Identity Resolver (IDR).
- **Peter** confirmed GS1's commitment but emphasized a gradual approach due to its 150+ member organizations.
- **Patrick** raised concerns about GS1's position on verifiable credentials, which **Steve** clarified, noting GS1's intention to implement the Digital Identity Anchor (DIA).

3. UNTP Information Architecture Update

- **Danika** presented an improved site structure for UNTP documentation.
 - Focus on simplifying navigation and making content more user-friendly.
 - Hierarchical model preferred over multidimensional structures to ease maintenance.
 - Stakeholder-specific guides added to streamline access to relevant information.
- **Patrick and Nick** supported the changes, emphasizing their clarity and usability.

4. UNTP Playground for Credential Validation

- **Ashley** demonstrated the latest features of the UNTP Playground, a tool for validating digital credentials.
 - Now supports conformance testing with **VCDM v2**, JSON-LD validation, and schema checks.
 - Users can generate downloadable **conformance reports** (eventually verifiable credentials).
 - Planned features include public **credential repositories** for verified implementations.
- **Patrick** suggested allowing direct downloads of **rendered HTML reports** from the Playground.
- **Zach** proposed highlighting the **extension model** for bulk materials to demonstrate practical applications.

5. Discussion: Bulk Materials & Digital Material Passport

- **Steve** raised the question of whether bulk materials (e.g., grain, crude oil, copper concentrate) require a **Digital Material Passport** separate from the **Digital Product Passport**.
- **Albertus, Nick, and Zach** argued that bulk materials should remain under **UNTP with extensions** rather than creating a new passport type.
- **Ali Bezirizadeh** noted different traceability needs between **radioactive materials, iron ore, and concentrates** and asked whether classifications would be standardized.

- **Peter** emphasized that **facility credentials** play a crucial role in bulk material traceability, not just the material itself.
- **Adrian** (from a crude oil trading and chemical background) argued that **a material passport is necessary** because crude oil and intermediates differ from finished products.
- **Steve** concluded that **real-world testing** should determine whether an extension is sufficient or if a new model is needed.

6. Closing Remarks

- **Steve** mentioned plans to create a **UNTP Media Page** listing external references to UNTP.
- Next steps:
 - Collect feedback on the **UNTP Playground** and **information architecture updates**.
 - Continue practical tests for **bulk materials in UNTP** before deciding on a separate material passport.
 - Publish the **media page** for community contributions.

2025-02-20 Meeting Summary

Facilitator: Steve (Speaker 1)

Attendees: Stefano, Danique, Suzanne, Virginia, Proc, Nis, Zach, Michael, Bart, Alex, Nick, David, and others.

Key Discussion Points:

1. UN-Sponsored Pilots and Governance of Extensions (Steve, Stefano)

- Steve shared updates on the UN-sponsored pilots on textiles and critical minerals, discussing whether they should have separate definitions or be grouped globally.
- Stefano emphasized the importance of the 80-20 approach for UNTP extensions.
- Discussion on governance and whether international bodies exist for specific minerals.

2. Public Review of Recommendation 49 (Suzanne, Steve, Virginia)

- Suzanne provided an update on Recommendation 49, which is about to go for public review.
- The review will be structured to minimize incoming changes before final approval.
- Virginia clarified that REC 49's review is distinct from the public review of UNTP, and it is important to ensure it is approved in July without unnecessary complications.

3. Concerns on UNTP Specification Readiness (Steve, Nis, Alex)

- Steve raised the question of whether the UNTP specification pages are sufficiently developed for public review.
- Nis suggested limiting the scope of what is reviewed, keeping only mature and essential parts.
- Alex proposed a more structured approach to incomplete sections by using placeholders instead of "TBC" labels.

4. Feedback on UNTP Documentation & Usability (Danique, Nis, Michael, Zach)

- **Danique's Review Findings:**
 - **Overload of information:** Fragmented resources, lack of clear examples.

- **Navigation Issues:** Users find it hard to access the right content.
- **Need for Role-Specific Guidance:** Different audiences require tailored documentation.
- **Business Case Clarity:** Implementers need to understand the practical value.
- **Recommendations:**
 - Consolidate resources, improve navigation, enhance onboarding with examples.
 - Use progressive disclosure to present information in digestible steps.

5. Simplifying UNTP and Restructuring Specs (Nis, Steve, Zach, Bart)

- Nis proposed removing unnecessary complexity from specifications, particularly in role-based access control.
- Steve agreed that UNTP should focus on essential functionalities and possibly split off components that are more general-purpose.
- Bart highlighted the challenge of transitioning from paper-based supply chains to digital ones and called for a phased approach.

6. Global Trust Register & Future Pilots (Steve)

- The Global Trust Register, involving the Spanish Business Register and Australian Livestock Identification Scheme, will conduct pilots to refine identity-related UNTP components.
- There's a need to balance current spec development with learnings from these pilots.

7. Action Items & Next Steps:

- **Steve:** Draft introductory guidance for the public review of UNTP.
- **Danique:** Continue improving the site's structure and usability.
- **Michael & Nis:** Publish an article simplifying UNTP's purpose and implementation.
- **Zach:** Implement better documentation flags (e.g., what's under review and how to give feedback).
- **All Participants:** Review and address outstanding issues to improve UNTP specs before public review.

2025-02-06 Meeting Summary

Chair: Steve (Speaker 1)

Participants: David (Speaker 6), Nancy (Speaker 7), Zach (Speaker 4), Virginia (Speaker 2), Clary (Speaker 7), Marcus (Speaker 5), and others

Key Topics Discussed:

1. Opening Remarks

- **Steve** welcomed participants, reminding them that this is a **UNTP meeting** and that contributions are **UN intellectual property (IP)**.
 - **Meeting was recorded**, with no objections raised.
-

2. Change Requests & Technical Updates

Identity Resolver Page Updates

- **Steve** walked through the process of how identifiers (product, facility, business) are resolved to find additional data (e.g., digital product passports).
- The page was reviewed to ensure it supports **existing identifier schemes** while accommodating **decentralized identifiers**.
- **Key Discussion Points:**
 - **David** raised concerns about persistence of product identifiers for **circularity** (e.g., for recycled materials).
 - **Steve** clarified that the document **focuses on resolving identifiers rather than defining data carriers** but acknowledged that **traceability extensions** address linkage between raw materials and finished products.
 - **Nancy** questioned the inclusion of **glyph identifiers**, and **Steve** clarified that examples were provided **without preference**.
 - **Virginia** suggested improving the diagram wording to **clearly show that different identifier schemes are supported**.
 - **Zach** proposed creating a **ticket to further discuss identifier persistence** in future updates.

Verifiable Credentials Specification Update

- **Ashley** proposed a change requiring **version 2.0** of the verifiable credentials specification instead of allowing both versions 1.1 and 2.0.
- **Technical team (Patrick, Nis)** had reviewed and approved the change, with no strong objections from others.
- **Decision: PR approved** to enforce the use of **Verifiable Credentials version 2.0**.

New Implementation Commitment

- **K4 Security (Korea)** expressed commitment to implementing UNTP.
- **Steve** verified their legitimacy and **no objections were raised** to adding them to the implementation list.

3. Implementation Guidance Page

- **Steve** introduced a new draft page to help organizations navigate the implementation of **UNTP**.
- **Five-Step Implementation Framework** was proposed:
 - i. Assess the **business case** for implementation.
 - ii. Identify **relevant pages** and register **intent to implement**.
 - iii. Choose **software solutions** or ask vendors for support.
 - iv. Run **pilot tests** and refine implementation.
 - v. Scale up.

Key Discussion Points:

- **Clary** suggested adding a section for **consulting and implementation services** to assist companies.
- **John** proposed including a section on **long-term governance** for managing UNTP extensions.

- **Virginia** recommended promoting **awareness of UNTP among SMEs**, encouraging them to request **UNTP-compatible software**.
- **Marcus** raised the question of whether software vendors should have **branding or certification** for implementing UNTP.
- **Steve, Virginia, and Zach** discussed the feasibility of an **accreditation or certification** program but agreed it would likely be managed by external certifiers, not the UN.

Decision:

- PR for **Implementation Guidance Page to be reviewed and merged**.
 - A **ticket will be created** for future discussions on **certification and branding** for software vendors.
-

4. Certification and Standards Governance

- Discussion on **who should maintain long-term governance of industry extensions** (e.g., Australian Agriculture Traceability Protocol - AATP).
- **Steve** proposed that **National Standards Bodies (NSBs)** (e.g., **Standards Australia, Canadian Standards Authority**) could be a good home for maintaining **industry-specific extensions**.
- **Virginia** and **Zach** agreed that **commercial certification bodies** (e.g., **SGS**) could handle **third-party accreditation** instead of the UN.
- **Zach** suggested forming a **working group** to explore governance models.

Decision:

- A **ticket will be created** to explore a **UNTP Certification & Accreditation Framework**.
-

##% 5. Closing Remarks

- **Steve** noted that **open issues had increased** from **50 to 81**, urging participants to **discuss issues between meetings** rather than waiting for calls.
 - **Final call for comments**, with **Marcus** expressing interest in joining discussions on **Australian standards**.
 - **Meeting adjourned**, and **minutes to be shared shortly**.
-

Next Steps & Action Items:

- ✓ **Merge** approved PRs (Verifiable Credentials update, Implementation Guidance).
- ✓ **Create tickets** for:
 - **Persistence of identifiers discussion**.
 - **UNTP Certification & Accreditation Framework**.
 - **Improving implementation guidance** for SMEs.
 - ✓ **Continue governance discussions with National Standards Bodies**.
 - ✓ **Review open issues** and prioritize for resolution before the next meeting.

2025-01-23 Meeting Summary

Date: January 23, 2025

Purpose: To review progress on the UNTP project, including governance updates, community activation plans, chain of custody models, and upcoming contributions.

Key Participants

1. **Steve** - Lead Facilitator, UNTP Working Group.
 2. **David** - Contributor to the Community Activation Plan (CAP).
 3. **Harley** - Presenter on chain of custody models.
 4. **Suzanne** - Contributor on governance and Recommendation 49.
 5. **Virginia** - Reviewer of governance and CAP documents.
 6. **Phil** - Technical advisor on identifiers.
 7. **Nick** - Contributor to CAP and technical workflows.
 8. **Brock** - Expert on battery supply chains and assurance models.
 9. **Adriana** - Advocate for collaboration tools like online whiteboards.
 10. **Zachary** - Contributor to sector-specific extension discussions.
-

Key Discussion Points

1. Governance Updates:

- **Steve** presented updates to the governance framework, emphasizing the relationship between core UNTP efforts and sector-specific extensions.
- Suggestions were made to clarify and simplify terms in the governance diagram, ensuring alignment between core and community-managed projects.

2. Community Activation Plan:

- **David** introduced a revised CAP focusing on engaging industry associations and encouraging adoption of UNTP extensions.
- Feedback included emphasizing ongoing maintenance of UNTP as a living framework, aligning diagrams with text, and including tangible examples for industry relevance.

3. Chain of Custody Models:

- **Harley** outlined four models: identity-preserved, segregation, mass balance, and book-and-claim.
- Discussions centered on how UNTP could support these models, particularly for industries like grain and aviation fuels.
- Feedback included adding examples, workflows, and details about trusted registries and technical implementations.

4. Collaboration Tools:

- **Adriana** suggested using online whiteboards like Mural for brainstorming, which was well-received.
-

Next Steps

1. Governance and CAP documents will be updated based on feedback and re-shared on Slack for further review.
2. Harley will refine the chain of custody draft, adding diagrams and examples before the next meeting.
3. Further discussions on identifiers and ontologies to be scheduled.

2025-01-08 Meeting Summary

Date: January 8, 2025

Purpose: Discuss progress and challenges in implementing UNTP projects, focusing on decentralized access control, sustainable mining, and collaborative contributions.

Participants

1. **Steve:** Meeting lead, discussed new implementation commitments, decentralized access control, and UNTP updates.
 2. **David Haycock:** Introduced as a new participant; emphasized experience in health and interoperability.
 3. **Nancy:** Shared insights on sustainable mining practices and challenges in global adoption.
 4. **Patrick:** Raised questions about right access and updating lifecycle events in decentralized models.
 5. **Adriana:** Asked about secret key management and user access to encrypted data.
 6. **Danica:** Provided clarity on publishing event histories and differentiating data updates.
 7. **Clary:** Highlighted European supply chain act requirements and selective disclosure use cases.
 8. **Harley:** Volunteered to lead discussions on managing mixed commodity challenges.
 9. **Nick:** Expressed interest in contributing to clean energy and mass balance discussions.
-

Key Discussion Points

1. New Contributions and Implementation Commitments:

- **Health LOQ** and **Simba Chain** (US-based) registered their intent to implement UNTP solutions following presentations on sustainability and traceability.
- The **Mining Association of Canada** committed to supporting the "Towards Sustainable Mining" (TSM) standards for global adoption.
- A pull request to update implementation lists was approved.

2. Decentralized Access Control:

- Explored models for granting secure access to non-public data, especially in cases involving lifecycle events or regulatory needs.

- Key challenges discussed:
 - Sharing secrets (e.g., QR codes or embedded keys) for access while preventing unauthorized use.
 - Managing sensitive updates, such as repair or recycling events, through authentication.
- Proposed approaches:
 - Encrypted data with secret keys shared through products.
 - Federated and decentralized authentication methods to scale access for unknown yet authorized roles (e.g., recyclers).

3. Sustainable Mining and Conformity Credentials:

- Nancy discussed the global adoption of TSM standards and their integration with UNTP frameworks.
- Highlighted regional adaptations and the importance of accreditation processes.

4. Selective Disclosure in Supply Chains:

- Clary emphasized the need for selective disclosure to comply with European regulations while protecting commercial sensitivities.
- Discussed methods for hiding specific attributes in digital product passports (DPPs).

5. Managing Mixed Commodities:

- Harley introduced challenges in managing blended commodities (e.g., grain, copper concentrate) under mass balance and book-and-claim systems.
- A working group was proposed to address technical and compliance requirements.

Tangible Outcomes

- Approved updates to implementation commitments and standards documentation.
- Initiated discussions on selective disclosure, lifecycle event management, and decentralized authentication.
- Agreed to form a subgroup to address mixed commodity challenges in agriculture and industrial contexts.

Next Steps

1. Documentation and Review:

- Update UNTP specifications for public review.
- Clarify technical details in decentralized access control and selective disclosure.

2. Collaborations:

- Engage stakeholders (e.g., recyclers, regulators) for pilot testing.
- Advance work on agricultural and clean energy projects (e.g., grain and hydrogen tracking).

3. Community Activation:

- Encourage Slack discussions and business-focused presentations to improve adoption.

Closing Remarks Steve emphasized the need for timely contributions and invited participants to join ongoing Slack discussions and subgroups for unresolved challenges. The next meeting is scheduled in two weeks.

2024-12-12 Meeting Summary

Date: December 12, 2024

Purpose: Discuss updates, collaboration opportunities, and next steps for UNTP and related projects.

Participants

- **Steve:** Meeting lead, discussed UNTP updates and coordination with various organizations.
- **Adriana:** Provided updates on the CERPAS project and emphasized the importance of interoperability and regulatory compliance in DPPs.
- **Patrick:** Shared experiences with BC Mines Act permits and raised technical concerns about schema flexibility.
- **Phil:** Contributed insights on updating DPPs and discussed GS1-related work.
- **Nick Smith:** Introduced his work on supply chain credentialing for emissions reporting.
- **Danika:** Highlighted her contributions to visual design for human-readable credentials.
- **Virginia:** Clarified distinctions between IEC, ITU, and other standards organizations.

Key Discussion Points

1. Updates from the Rome Forum:

- Progress on UNTP and collaboration with ISO, CENCENELEC, and ITU.
- A UNECE co-lead for ISO TC154 work was introduced to ensure alignment with UNTP.
- Upcoming WWF pilots on sustainable practices in food and agriculture.

2. CERPAS Collaboration:

- Adriana discussed challenges and progress in interoperability and regulatory standards for DPPs.
- Identified gaps in user stories and opportunities for collaboration on pilots.

3. Testing and Implementation:

- UNTP aims to finalize data models for conformity credentials by April 2025.
- Volunteers sought to test mapping for industries like batteries, agriculture, and the built environment.

4. Technical Concerns:

- Patrick raised issues about schema flexibility for extending digital conformity credentials.
- Discussions on managing updates and linking credentials (e.g., service events).

5. Future Collaboration:

- Interoperability testing planned for early 2025.
 - Interest in pilot programs with industrial partners like Century Batteries.
-

Actions and Next Steps

1. Pilot Projects:

- Explore pilots in various industries, including Australian agriculture and batteries.
- Adriana and Nick Smith to coordinate potential Australian collaborations.

2. Schema Flexibility:

- Patrick to raise a GitHub issue to address schema concerns and ensure extension compatibility.

3. Testing:

- Volunteers to test mapping of UNTP credentials to specific industries.
- Focus on identifying gaps and refining data models before the first release.

4. Documentation:

- Update UNTP pages on decentralized access control and interoperability patterns.
- Publish mapping tools to assist contributors unfamiliar with JSON schema.

5. Next Meeting:

- Scheduled for January after the holiday break.
-

Closing Remarks

- Participants shared holiday greetings.
- Steve emphasized ongoing collaboration through Slack and the mailing list.

2024-11-28 Meeting Summary

Meeting Summary: UNTP Agricultural Extensions and Tools

Date: November 28, 2024

Chair: Zachary

Participants:

- **Zachary (Speaker 1):** UNTP facilitator, leading discussions.
- **Ashley (Speaker 2):** Consultant, showcased technical tools and developments.

- **Adrian (Speaker 9):** Representing the BSF Group, Switzerland, focusing on supply chain transparency.
 - **Adriana Zacche (Speaker 3):** Circular Economy Asia, specializing in resource management.
 - **Suna (Speaker 10):** SME in Brussels, leading EU compliance initiatives for digital product passports.
 - **Phil (Speaker 4):** GS1 advocate for verifiable credentials.
 - **Michael (Speaker 5):** Provided feedback on business case development.
 - **Stefano (Speaker 7):** EU-focused discussions on UNTP implementation.
 - **Additional Contributors:** Marcus, Charles, Brett, and others engaged with questions and insights.
-

Agenda:

1. Introductions and Updates

- New participants introduced their roles and interests in digital transparency and supply chain management.
- Zachary highlighted the meeting's focus on agricultural traceability protocols and business case discussions.

2. Demonstrations:

- **Sample Credentials:**

Ashley showcased the development of sample digital product passports and credentials, highlighting user-friendly rendering formats for non-technical stakeholders.

- **UNTP Playground:**

A prototype tool for testing the compliance of digital credentials with UNTP standards was demonstrated, receiving positive feedback from participants.

3. Australian Agriculture Traceability Protocol (AATP):

- Ashley and Zachary detailed AATP's role as an extension of UNTP, tailored to livestock and agricultural needs in Australia.
- Examples included livestock passports incorporating biosecurity data and deforestation compliance for feed sources.
- Discussion on the readiness and potential launch timeline, targeting late 2024.

4. Feedback and Questions:

- **Phil:** Raised concerns about demonstrating the value of technical standards to business users and emphasized practical evidence over technical details.
- **Adriana:** Discussed resource management challenges and access controls for circular economy-focused businesses.
- **Marcus:** Advocated for linking traceability tools to complementary systems (e.g., methane reduction from seaweed-based feed).

5. Extensions and Use Cases:

- Discussion on replicability of the AATP model for other sectors, including critical minerals, electronics, and the built environment.

6. Business Case Development:

- Participants sought updates on pending business case materials for the UNTP repository, with action points for follow-up on outstanding documentation.

7. Future Plans:

- Expansion of UNTP applications in agriculture and alignment with global standards.
- Continued refinement of tools like the playground and integration of user feedback.

Next Steps:

- Finalize and publish AATP materials.
- Address pending business case and technical issues.
- Provide demonstrations linking agricultural traceability with broader sustainability objectives.

2024-11-14 Meeting Summary

Meeting Summary:

On **November 14, 2024**, the UNTP working group convened to review recent updates, discuss business cases, and explore testing strategies for the UN Transparency Protocol (UNTP) implementation. The meeting, hosted by **Steve (Speaker 1)**, began with a brief welcome and a reminder of upcoming meetings that cater to global time zones.

Participant Introductions:

- **Adriana Zachary (Speaker 7)**: CEO of Circular Economy Asia, volunteered on digital product passport initiatives and contributes to user access, data authentication, and standards working groups.
- **Pat (Speaker 5)**: Technical Product Manager from San Francisco with experience in digital product passports for OEMs.
- **Nancy (Speaker 3), Luca (Speaker 6), Michael (Speaker 3), and Zach (Speaker 10)** also actively contributed to the conversation, particularly regarding business cases and technical support needs.

Key Discussion Points:

1. New Commitments from Industry Sectors:

- The **Responsible Business Alliance (RBA)**, representing major electronics and automotive companies, committed to implementing UNTP extensions for digital product passports and traceability.
- The **International Code Council**, in collaboration with Standards Australia, aims to create sustainability vocabulary for building codes. This commitment includes alignment with European Union regulations.

2. Business Case Development:

- Michael has been refining the business case templates to differentiate between **government** and **industry** needs. Steve reviewed the new layout, adding contextual insights on historical and current trends in corporate sustainability, noting a shift from regulatory compliance toward strategic integration.
- The business case content, which includes **value and cost categories** for implementing UNTP, is structured to assist organizations in building tailored cases for executives. The group agreed on the necessity of further refinement, with Michael suggesting a follow-up review session.

3. Implementation and Testing:

- To support the various software providers implementing UNTP, Steve proposed creating a **community-driven technical support ecosystem**. The group discussed leveraging an open-source approach for the test suite, allowing mutual support and continued development.
- **Pat** and **Nis** were suggested as potential leaders of this technical support group, which would guide implementers through the **UNTP test suite**. Testing will include both technical conformance and business use case validations specific to industries.

4. Testing Structure:

- The testing approach includes three layers:
 - **Technical interoperability** for ensuring compliance with W3C standards.
 - **Schema conformance** for validating UNTP's unique frameworks.
 - **Industry-specific testing** for sectors using custom extensions.
- **Jason (Speaker 2)** emphasized reporting tools to document testing results, which could serve as valuable evidence of compliance for implementers.

Closing Remarks:

Steve concluded by celebrating the day's progress, noting the importance of industry extensions and the growth of the business case documentation. He thanked the team for their collaboration and welcomed further input from new and existing members.

The next steps involve finalizing the business case documentation, establishing a technical testing support group, and resolving any issues with the public release of content updates. The meeting adjourned with gratitude for the participants' contributions and commitments to the UNTP initiative.

2024-10-31 Meeting Summary

Meeting Summary

Participants:

- **Steve (Speaker 1):** UN Representative, project lead on UNTP.
- **Stefano (Speaker 6):** Liaison with EU directorates, providing updates on coordination efforts.
- **Virginia (Speaker 6):** Providing feedback on governance and licensing.
- **Phil (Speaker 4):** Brief input on registration processes.

- **Suzanne (Speaker 2)**: Contributed insights on standard profiles and security specifications.
- **Nis (Speaker 5)**: Discussed implementation requirements and test cases.
- **Luca (Speaker 8), Jordan (Speaker 9), Dr. Wang, and Martina Paul**: Various inputs related to standards and technical topics.

Key Topics:

1. UNTP Governance and Extension Methodology:

- Steve introduced the UNTP extension methodology, designed to create industry-specific standards based on UNTP's core. Discussions focused on extension governance, transparency, and the criteria for official UN endorsement.

2. Digital Product Passport (DPP) Initiatives:

- Updates were provided on new collaborations with ISO TC154, IEC, and other regulatory groups to align DPP standards across industries. Dr. Wang's potential involvement in the ISO TC154 project was noted.

3. Technical Specifications for Extensions:

- Suzanne and others discussed the need for security profiles and identifier schemes for robust operational implementations. Agreement to add technical profiles, such as encryption and protocol requirements, to the extension methodology.

4. Implementation Registration:

- Nis's implementation of UNTP was acknowledged as the first to meet compliance requirements, with future test suites planned to verify consistency.

5. Conformity and Visibility:

- Suggestions were made to improve visibility of UNTP implementations and their industry affiliations, enhancing marketing efforts to non-technical audiences.

Next Steps:

- Steve will merge the current extension methodology PR, and the team will refine with specific technical profiles.
- Nis and others will participate in initial test suite trials.
- UNECE will work on promoting UNTP implementation visibility, potentially adding links and marketing content for public accessibility.

2024-10-17 Meeting Summary

Meeting Summary

Participants:

- **Steve (Speaker 1):** UN Representative and project lead on UNTP standards.
- **Phil (Speaker 5):** Discussed the registration process for UNTP implementation.
- **Virginia (Speaker 6):** Provided input on implementation and test suite requirements.
- **Gerhard (Speaker 4):** Contributed insights on bulk product tracking.
- **GS1 Representatives (Speaker 2 and Speaker 3):** Discussed identity standards and resolver frameworks.
- **Dr Wang Xiang**

Key Discussion Points:

1. UNTP Credential Update:

- **Version 0.5.0:** Released for testing with credentials for digital product passports, conformity, traceability events, and facility records. Around 13-14 software providers and several regulatory bodies have committed to implementation.
- **Implementation Registry:** A GitHub-hosted registration process guides companies in joining the initiative and tracks active implementers, marking a new approach for the UN in standard adoption tracking.

2. Test Suite and Implementation Process:

- **Test Suite:** Expected in two weeks. The group recommended that companies wait for the suite to ensure consistent conformance testing.
- **First Implementer:** Transmute has completed an initial implementation, but the group advised a formalized test to verify compliance.

3. Identity Resolution Process:

- **Workflow Diagram:** Steve introduced a flowchart detailing steps to resolve, verify, and link identifiers, emphasizing both registered and self-issued identifiers. He highlighted a need to address bulk commodities like minerals.
- **Challenges with Bulk Commodities:** Bulk products lack unique identifiers, complicating traceability. Suggestions included using shipment or consignment IDs for identification.

4. Trust Anchors and Verification:

- **Potential of Trademark Offices:** EUIPO is considering involvement, where trademark verification could serve as a trust anchor for product claims.
- **Domain and Business Registry Checks:** DNS ownership and business registries were discussed as potential trust mechanisms, though complex in some cases.

5. GS1's Approach to Identity Resolution:

- **Cataloging Identifier Schemes:** Steve suggested a UN-hosted catalog for identifier schemes. Challenges included governance complexities and ensuring neutrality.

6. Future Steps and Closing Remarks:

- **Further Asynchronous Feedback:** Steve invited ongoing comments on the resolver and bulk tracking processes.

Next Steps:

- Steve to raise a pull request (PR) for further review on the identity resolution process.
 - Ongoing exploration of bulk commodity identification and potential collaboration with EUIPO on trademark verification.
-

This summary captures named participants, key decisions, and next steps discussed in the meeting.

2024-10-03 Meeting Summary

Meeting Summary

Date: October 3, 2024

Attendees: Steve, Stefano, Brett, Virginia, Michael O'Shea, Christoph, Susanne, Peter Carter, Nancy, Luca, Dr Wang Xiang, and others.

Agenda:

1. Zoom Meeting Timing Issues

- Steve mentioned difficulties with Zoom invites. Some participants received only the 8 a.m. invite and not the 8 p.m. one for the next meeting. Steve apologized and promised to resend the correct invites after the meeting.

2. Business Case Content Discussion

- The meeting focused on reviewing the business case content developed by Michael O'Shea and his team. Steve emphasized that the business case section should be clear, simple, and provide value for stakeholders.

3. Digital Product Passport (DPP) Technical Update

- Steve announced the release of version 0.4.1 for the DPP, including core vocabulary, facility records, and conformity credentials. There were a few minor technical bugs identified, which might lead to a version 0.4.2 release.
- Michael also showcased a visualization tool for a lithium-ion battery passport, which was praised by the team.

4. Bug Reports and Typos

- A participant from Canada found several bugs in the latest release, mostly typos and small technical issues like missing terms and empty context files. The team debated whether to fix these before the business case testing.
- Christoph offered to help review the business case documents to ensure the technical and business sides align well.

5. Business Case for Change

- Michael and his team presented their work on the business case for both private sector businesses and regulators. They discussed the need to balance the technical content and value statements in a way that appeals to both.

- Christoph and Susanne provided feedback that the business case should distinguish between benefits for corporations and regulators to avoid confusion. They also suggested adding infrastructure-related benefits, specifically for regulators.

6. Feedback on Business Case Template

- Steve asked for volunteers to review the business case model from a business perspective, ensuring it makes sense to potential adopters, especially in terms of convincing a CFO.
- Christoph volunteered to help review the business case spreadsheet, and Steve proposed sending the document to the wider mailing list for feedback once it has been internally reviewed.

7. Next Steps:

- Finalize version 0.4.2 of the DPP to address minor technical bugs.
- Refine and simplify the business case content and spreadsheet to make it more accessible.
- Collect feedback from the team and mailing list before publishing the business case template publicly.

Next Meeting:

The next meeting will be in two weeks, and Zoom invites for both 8 a.m. and 8 p.m. sessions will be corrected and sent out.

2024-09-19 Meeting Summary

Date: September 19, 2024

1. **Steve (Speaker 1)** - Chairperson
2. **Stefano (Speaker 4)** - Contributor from Reload3P and Morpheus Network
3. **Nis (Speaker 5)** - Presenter of DPP implementation
4. **John (Speaker 6)** - Contributed to the discussion on meeting structure
5. **Suzanne (Speaker 3)** - Discussed the REC 49 policy document and traceability issues
6. **Sébastien (Speaker 9)** - Contributed to the technical discussion on GS1 standards
7. **Brett (Speaker 7)** - Provided insights on the TSM credential issue
8. **Michael (Speaker 2)** - Provided updates on the business case development

Key Discussions and Contributions

1. Registration Requests:

- Steve introduced the agenda, primarily discussing new registration requests.
- Stefano (Speaker 4) spoke about his contributions, including those from **Reload3P** and **Morpheus Network**. The work focuses on sustainability and transparency within supply chains.
- Nish (Speaker 5) presented a **DPP implementation** on his platform, aiming to include **UNTP schemas** as a template, making it easier to issue credentials.

- Steve also mentioned other registration requests, including those from Viko (not present) and an Australian scheme for structural steel.

2. Pull Requests:

- Nish highlighted a pull request addressing minor **syntax bugs**. Steve admitted the errors might have occurred during manual editing and promised to check with Alistair.

3. Upcoming Work on REC 49 Policy Document:

- Steve discussed the need to revisit the **REC 49 policy document**, considering feedback from the July 2024 plenary. The goal is to finalize the document for the next plenary in July 2025.
- Steve proposed alternating **fortnightly meetings**, separating policy and technical discussions. John and Stefano supported this idea.

4. Human Readability in Traceability Events:

- Steve proposed making **traceability events** more human-readable, adding optional human-readable properties. Stefano, Suzanne (Speaker 3), and Sébastien (Speaker 9) contributed to the discussion, suggesting using existing GS1 standards to improve readability.

5. TSM Credential Issue:

- The group discussed a pattern where **different auditors** assess different sections of a standard over time, which leads to multiple assessments. Steve suggested adding an **auditor party reference** to the conformity credential model to solve the issue. Brett (Speaker 7) agreed with Steve's proposal.

6. Business Case Updates:

- Michael and John provided an update on the **business case development**, focusing on business and public sector value arguments. Nancy's input, particularly from the public sector perspective, was highlighted as key.

7. Next Steps:

- Steve planned to raise tickets for various issues discussed and to prepare **pull requests** based on registration approvals and the business case document.

The meeting ended with a commitment to continue work on registrations, policy revisions, and technical improvements.

2024-09-11 Meeting Summary

Participants:

- **Steve Capell**
- **Virginia Cram-Martos**
- **Dr. Wang Xiang**
- **Christophe** (Association des Centraliens)

- **Joe** (last name not mentioned)
 - **Esther** (last name not mentioned)
 - **Brie** (last name not mentioned)
 - **Patrick** (last name not mentioned)
 - **Todd Taylor**
 - **Nancy** (last name not mentioned)
 - **Phil Archer** (not present, mentioned as being on holiday)
-

1. Opening Remarks:

- **Steve Capell** welcomed the participants and noted the absence of Phil Archer due to holiday. The meeting started with an agenda to discuss ongoing initiatives and updates on standards and implementations.

2. Discussion on Standards and References:

- **Virginia Cram-Martos** raised a couple of points regarding typos and clarity in a recently published page on references to standards. Specifically, she suggested improvements to the readability of certain sections, including changes to the terminology around cryptographic links and facility identities.
- There was a discussion on how UNTP should relate to standards like SEND and ISO, with the consensus being that these should focus on complementing existing standards rather than reinventing them.

3. Technical Matrix for Standards:

- **Virginia** and others provided feedback on a matrix listing standards and their relationship to UNTP components. There were suggestions to improve the readability of this matrix by possibly reformatting it or providing tooltips for acronyms to make it more accessible.

4. Community Implementations:

- **Steve Capell** reviewed several commitments to UNTP implementation that had been submitted over the past week. Notable entries came from the **British Columbia Government** and various software vendors.
- **Patrick** highlighted that BC's open-source governmental software could be leveraged by other provinces, emphasizing collaboration between BC, Ontario, and Quebec in developing tools like mobile wallets and identity solutions.

5. Business Case and Metrics:

- The discussion shifted to how UNTP would gather metrics on its implementation, with a consensus that any reporting should only include information that the implementing parties would be willing to publish publicly.
- **Brie** pointed out the importance of linking corporate-level and site/facility-level data, particularly for standards like TSM (Towards Sustainable Mining), which have different levels of granularity.

6. Stability and Version Freezing for Pilots:

- The group discussed freezing the UNTP version at **0.4.0** to stabilize the implementation for the next round of pilots. The goal is to ensure technical consistency while allowing further refinements based on pilot feedback.

7. Next Steps:

- **Steve Capell** proposed continuing discussions on identifying which remaining tickets need to be resolved before version 0.4.0 is finalized.
- There was also a brief discussion about cross-referencing implementations between UNTP and other projects, such as the **Critical Raw Materials (CRM)** project, to avoid duplication while maintaining transparency.

2024-09-05 Meeting Summary

Meeting Participants:

1. **Dr. Wang** - Provided an update on the UNTP presentation translation into Chinese
2. **Steve** - Discussed the TC154 project and provided updates
3. **Michael** - Business case development lead
4. **Phil** - Provided comments on vocabulary management
5. **Gerhard** - Commented on testing and evidence for implementations
6. **Nis** - Raised concerns about versioning and semantic context

Key Discussion Points:

1. Translation and Feedback:

- Dr. Wang translated the UNTP (United Nations Trade Procedure) presentation into Chinese and received positive feedback during a workshop. This sparked further discussion on expanding outreach and engagement.

2. TC154 Digital Product Passport Project:

- Steve provided updates on the ongoing work related to the TC154 Digital Product Passport. He mentioned that the ISO meeting, likely to occur in Korea in October, would decide whether to launch the project.
- There was a one-on-one discussion with the project lead, emphasizing the need for a comprehensive program rather than a single standard, drawing parallels to existing multiple specifications.
- Steve encouraged Dr. Wang to join future collaborations under TC154.

3. Business Case Development:

- Michael shared that the team is working on a model to help businesses understand the impact of implementing UNTP and developing a business case around it.
- Examples like the EU's Battery Pass Project and Surpass were discussed as templates for businesses to build their justification for implementation.

4. Community Activation:

- There was a discussion on how community-level adoption of standards could enhance business cases, particularly in scenarios where multiple actors (e.g., farmers or manufacturers) use shared tools or processes, reducing costs and increasing benefits.

5. Technical Infrastructure and Versioning:

- Several participants discussed the challenges related to managing vocabulary, version control, and ensuring consistency in the digital product passport pipeline.
- A solution involving vocabulary sites, schema versioning, and simplified context files was introduced by Steve, while Nis raised concerns about frequent updates to context files and their potential to disrupt system setups.

6. Implementation and Testing:

- The team discussed creating a register of implementations, inviting stakeholders to express their intent to implement UNTP standards. This will help assess the adoption of these standards.
- The importance of evidence for successful implementation, such as test results, was emphasized by Gerhard and others.

7. Next Steps:

- The pull request related to implementation registers and vocabulary updates was approved.
- The meeting ended with a reminder to continue working on the pull requests and to solicit early expressions of interest from potential implementers.

2024-08-28 Meeting Summary

Participants:

- **Steve Capell**
- **Virginia Cram-Martos**
- **Dr Wang Xiang**
- **Ester Cunha**
- **Nancy** (last name not mentioned)
- **Michael O'Shea**
- **Anne** (last name not mentioned)
- **Joe** (last name not mentioned)
- **John Phillips**
- **Guy** (last name not mentioned)
- **Marcus** (last name not mentioned)

1. Opening Remarks:

- The meeting started with greetings from **Steve Capell**. **Steve** mentioned that the meeting might be brief due to a smaller group and the absence of full requests to review. The agenda was to share thoughts and discuss ongoing ideas.

2. Project Updates:

- **Steve Capell** provided an update on a meeting with ISO TC154 regarding a potential new project for a global digital product passport. This project is being pushed by the China National Institute of Standards and is in the early proposal stages. The project will be a joint collaboration with UNECE.
- **Nancy** discussed updates related to the UNTP extension site, focusing on the critical raw materials extension. She suggested creating a one-page value proposition template to assist early adopters, particularly mining companies, in implementing the UNTP.

3. Business Case Development:

- **Nancy** emphasized the importance of developing a business case framework that can evolve with more data during the pilot phases. She highlighted the need for a robust business case to secure funding for post-pilot projects.
- **Anne** and **Joe** provided updates on a spreadsheet they developed to guide participants through creating a value case or business case for UNTP implementation. The focus is on calculating ROI over a 10-year period.

4. Community Activation:

- **Steve Capell** discussed the necessity of community activation before moving into full implementation phases. He cited examples from Australian agriculture, where community activation was crucial for project success.

5. Technical and Regulatory Challenges:

- **Guy** raised challenges regarding the allocation of emissions to products, especially in critical minerals sectors. There was consensus that allocation rules are often unclear, and industry-specific guidance might be necessary.
- **Virginia Cram-Martos** asked about the conflict between counterfeit issues and the right to repair, leading to a discussion on the regulatory landscape and its impact on standards.

6. Next Steps:

- **Steve Capell** mentioned plans to establish a structure for registering commitment to implementation by different categories. There was also a focus on developing content for community activation and the business case guide.
- The meeting concluded with **Steve Capell** inviting participants to continue their contributions and to attend future meetings.

This summary includes the names of the participants and captures the key points discussed during the meeting. If you need further adjustments or more details on any section, please let me know!

2024-08-22 Meeting Summary

Date: August 22, 2024

Speakers:

- **Steve** (Host)
- **Michael O'Shea** (Speaker 4)
- **Phil** (Speaker 3)
- **Zach** (Speaker 2)
- **Nis** (Speaker 6)
- **Brett** (Speaker 7)

Key Points:

1. Business Case Content Development:

- Steve introduced the development of business case content led by Michael O'Shea and his team.
- The team has begun working on creating a table that outlines the business case by identifying stakeholders and categorizing value points.
- The objective is to have a shareable document by mid-September, aiming to refine and organize the content for clarity.

2. Digital Product Passport (DPP) Updates:

- Steve discussed updates to the digital product passport, including the inclusion of context and schema files to support future implementation.
- Emphasis was placed on making the DPP consistent with existing standards and ensuring it is easy to implement while valuable for verification.

3. Vocabulary and Schema Mapping:

- The team discussed the challenges of mapping data to established vocabularies such as schema.org and GS1.
- The focus is on maintaining consistency and preventing issues like breaking proofs during versioning.

4. Implementation Interest:

- There was discussion on the timing of soliciting commitments from organizations to implement the UNTP standard.
- It was agreed that the right time is approaching, and efforts to socialize the project and secure interest should begin.

5. Next Steps:

- Steve and the team will work on refining the business case and moving towards creating a stable 1.0 release by Christmas.
- A call for implementers will be prepared to start gathering interest and commitments from potential adopters.

Action Items:

- Michael and his team will continue refining the business case content with the goal of having a draft ready by mid-September.
- Steve will work on fixing identified bugs and preparing materials to solicit implementation commitments.

Next Meeting:

- Focus will continue on the business case, schema updates, and gathering implementer commitments.

Conclusion:

The meeting ended on a positive note, with everyone feeling that significant progress is being made towards finalizing the UNTP standard and building momentum for broader adoption.

2024-08-15 Meeting Summary

Date: August 14, 2024

Attendees:

- **Steve** (Speaker 1)
- **Phil** (Speaker 2)
- **Virginia** (Speaker 4)
- **Zach** (Speaker 5)
- **Patrick** (Speaker 3)
- **Harley** (Speaker 13)
- **Todd Taylor** (Speaker 7)
- **Bree** (Speaker 8)

Key Discussion Points:

1. Pull Request Review (Phil's Updates):

- Phil discussed the simplification of terminology in the pull request. His changes primarily involved correcting typos and substituting GS1 references with corresponding ISO/IEC standards for event tracking and business vocabularies. This was done to align politically and avoid implying that GS1 identifiers are mandatory for using EPCIS.
- Steve and others approved the pull request, agreeing to merge it as it was a simple update.

2. ISO and UN Involvement in Global Digital Passport Standards:

- Steve mentioned an upcoming meeting at ISO to review a candidate project proposed by a Chinese standards authority to develop a global digital passport standard. He was invited to co-chair this initiative, potentially representing both the UN and ISO. The group discussed the significance of this project and the potential implications of having a UN co-chair involved.
- Phil provided additional context, mentioning the Vienna Memorandum, an agreement between ISO and CEN-CENELEC to avoid duplication of efforts in standard development. He also noted GS1's interest in participating in the project.

3. New Digital Facility Record Proposal:

- Steve introduced the idea of adding a new credential type, a **Digital Facility Record (DFR)**, to the UN Transparency Protocol (UNTP). This record would focus on the facility itself rather than the product and could be used to track sustainability assessments at the facility level.
- Virginia and Phil supported the idea, with Virginia suggesting the term "Facility Profile" to better represent the data. The group discussed how this could streamline sustainability reporting by making facilities first-order objects rather than secondary attributes of products.

4. Challenges with Product Passport Updates:

- Zach raised concerns about updating digital product passports (DPPs) after they have been issued, such as adding post-sale repair events or certifications. The group acknowledged that while updates are crucial, there are challenges with ensuring that only authorized entities can modify the passport.
- Steve proposed the idea of allowing certain events to be added to a product passport by authorized third parties, like certified repairers or recycling plants, using a delegated authority model.

5. Formation of a Working Group:

- A new working group was formed, led by Zach, to explore solutions for managing updates to digital product passports. The group will work on defining the conditions under which updates can be made and will consider different approaches to identity resolution and authorization.

6. Conformity Assessment Scheme Clarification:

- Bree raised a question regarding the linkage between conformity assessment schemes and regulations within the digital product passport framework. Steve clarified that in the context of product conformity, an assessment can reference multiple standards or regulations, bundled together in a scheme.
- The group discussed how this framework might need to be adapted for regulatory permits and other credentials outside of product conformity.

Action Items:

- **Phil** and **Zach** to collaborate on a working group to explore digital product passport updates.
- **Steve** to create a proposal for the Digital Facility Record and present it for further review.
- **Bree** and **Patrick** to revisit the mapping of assessment schemes to regulations for conformity credentials and report back on potential updates to the framework.

Conclusion: The meeting focused on refining standards around digital product passports, facility records, and conformity assessment schemes. The formation of a working group will drive further exploration of issues related to product passport updates and maintaining data integrity across complex supply chains.

2024-08-01 Meeting Summary

Date: August 1, 2024

Speakers:

- **Steve** (Host)
- **Martin Pompery** (Speaker 2)
- **Zach** (Speaker 3)
- **Christophe** (Speaker 4)
- **Virginia** (Speaker 5)
- **Nancy** (Speaker 6)
- **Phil** (Speaker 7)
- **Juliet** (Speaker 8)

Key Points:

1. Introduction and Attendance:

- Steve began the meeting, noting the recording and summary availability.
- Martin Pompery introduced himself as a co-founder of the SINA Foundation, focusing on carbon transparency protocols with the World Business Council for Sustainable Development.

2. Business Case for the UNTP:

- Steve presented an initial contribution to the business case for the UNTP, highlighting the costs and benefits for potential implementers.
- The business case was divided into three parts:
 - Costs and benefits for individual supply chain actors or regulators.
 - Costs and benefits for communities.
 - Reporting the value and cost of implementations for benchmarking.

3. Feedback on Business Case:

- Christophe agreed with the categories but questioned the final product's specificity.
- Virginia emphasized the need for cost-benefit arguments for public authorities and not-for-profits.
- Nancy noted the importance of differentiating between pilot and long-term participation.

4. Emissions and Circularity Performance in Digital Product Passports:

- Steve discussed adding emissions and circularity performance to digital product passports.
- Emissions performance would include high-level carbon footprint data with scope and reference standards.
- Circular performance would measure linear flow index and utility, reflecting recycled content and product durability.

5. Challenges and Considerations:

- Martin and Christophe highlighted the complexity and variability in measuring carbon footprints.
- Zach questioned the governance structure for adding summary boxes and emphasized aligning with sustainable development goals.

- The balance between simplicity for ease of implementation and the need for detailed, reliable data was a recurring theme.

6. Future Steps:

- Agreement to merge the initial business case content and continue refining it.
- Continued deliberation on representing frameworks like the Pathfinder Framework in digital product passports.
- Emphasis on simplicity to encourage voluntary adoption while ensuring reliable and comparable data.

Action Items:

- Steve to merge the initial business case contribution and iterate based on feedback.
- Further discussion on the appropriate level of detail for emissions and circularity performance in digital product passports.
- Consideration of additional examples and practical applications to test the proposed structures.

Next Meeting:

- Focus on refining the business case and exploring practical examples of implementing the digital product passport framework.

Conclusion: The meeting concluded with acknowledgment of valuable feedback and a commitment to ongoing collaboration to achieve a balanced and implementable framework.

2024-07-25 Meeting Summary

Attendees:

- Steve (Speaker 1)
- Phil (Speaker 2)
- Luis (Speaker 3)
- Suzanne (Speaker 4)
- Michael (Speaker 7)
- Virginia (Speaker 8)
- Zach (Speaker 5)
- Brett (Speaker 6)
- Marcus (Speaker 10)
- Vinayak (Speaker 9)
- Chris (mentioned)
- Gerhard (mentioned)
- Vladimir (mentioned)

Agenda:

1. Review of Previous Meetings and Updates
2. Discussion on TrustGraphs Demo
3. Pull Requests Review
4. Issues Discussion

Key Points:

1. Review of Previous Meetings and Updates:

- **Steve:** Recapped the presentations given at the recent forum and plenary sessions, highlighting the positive reception and support received, except for a minor objection from the European standards organization.
- Discussed expanding the group to include more people from non-technical backgrounds in sustainability and the potential for collaboration with CEN and ISO on new projects.

2. Discussion on TrustGraphs Demo:

- **Nis:** Inquired about a planned demo on TrustGraphs.
- **Steve:** Mentioned that Harley, who was supposed to present, is preparing a more refined demo incorporating recent standards, scheduled for two weeks later.

3. Pull Requests Review:

• Suzanne's Pull Request:

- **Steve:** Suggested Suzanne review the latest content and update her pull request accordingly.
- **Suzanne:** Agreed, mentioning she is still learning and appreciated the feedback.

• Phil's Pull Requests:

- **Phil:** Made minor corrections to the naming of the W3C standard and clarified the terms VC and VCDM.
- **Phil:** Added substantial content on global uniqueness and resolvability, including some necessary corrections.

• Steve's Pull Request:

- **Steve:** Presented updates to the digital product passport page, making it more implementer-friendly with examples and snippets.
- Discussions were held on further improvements, including explaining color codes in diagrams and fixing URLs and date formats.

4. Issues Discussion:

- **Sustainability Vocabulary Design:** Ongoing discussions on how to represent various standards and regulations meaningfully.
- **Units of Measure:** Phil confirmed that the current use of UN Rec20 codes is satisfactory.
- **Reference Standards Page:** Discussion on creating a separate page for reference standards and acronyms.
- **Human Observations as Valid Sensors:** Zach discussed the need for guidance on incorporating human observations in low digital maturity environments.
- **General Issues:** Several older issues raised by Gerhard and Vladimir were reviewed for potential closure.

Next Steps:

- **Steve:** Will address the feedback received on the digital product passport page and update the conformity credential page similarly.
- **Vinayak:** Volunteered to map the GBA's digital product passport data model to the UNTP framework.

Action Items:

1. **Suzanne:** To review Steve's updates to her proposed changes
2. **Steve:** To fix issues on the digital product passport page and update conformity credentials.
3. **All:** To create a glossary page for standards and acronyms.
4. **Zach:** To incorporate feedback into discussions on human observations as sensors.
5. **Vinayak:** To map the GBA digital product passport data model to UNTP.

Conclusion: The meeting concluded with thanks to all participants and a note that the next meeting will focus on further pull requests and issues.

2024-07-17 Meeting Summary

Attendees:

- Steve (Speaker 1)
- Jason (Speaker 2)
- Virginia (Speaker 2)
- Phil (Speaker 2)
- Zack (Speaker 2)
- Other unidentified speakers

Key Points Discussed:

1. Meeting Logistics and Technical Issues:

- Steve welcomed participants and acknowledged technical issues faced by Virginia.
- Virginia requested a list of acronyms to better understand emails and documents.

2. Review of Recent Forum and Plenary Sessions:

- Steve reviewed the recent UNTP forum and plenary sessions, highlighting the presentations on VCs, security, language vocabularies, and business models.
- Positive feedback and increased volunteer participation were noted.
- Discussions on separating technical work from business use cases and engaging business experts from the UNECE Team of Specialists on Sustainable Value Chains.

3. Concerns from CENELEC and Collaboration Opportunities:

- CENELEC, the European Standards Body, expressed concerns about potential duplication of work with the UNTP.

- Robust discussion ensued, with other member states (USA, Canada, Australia, Singapore) supporting a global standard.
- Proposal to collaborate with CENELEC to ensure interoperability and avoid duplication.
- Discussion on lobbying the European Commission to support the UNTP's global standard approach.

4. Integrating Business Experts into Technical Sessions:

- Suggestions on how to integrate business experts into technical sessions, either by inviting them to specific meetings or having dedicated sessions for business input.

5. Pull Request Review and Data Model Updates:

- Steve presented a significant pull request addressing multiple issues and reorganizing business objects into a separate vocabulary for better consistency and reuse.
- Discussion on the importance of proper data structure for creating transparency graphs in supply chains.
- Request for a detailed walkthrough of the data model to help team members understand the changes and contribute effectively.

6. Tooling and Versioning for Context Files and Vocabularies:

- Introduction of a deployment pipeline for versioned vocabularies and context files to ensure stable and robust implementations.
- Emphasis on the need for good governance and tooling to maintain consistency and prevent breaking changes in issued credentials.

7. Next Steps and Action Items:

- Plan to write a response to the German delegation, engaging with the European Commission for support.
- Agreement to focus the next meeting on a deep dive into the data model and its associations.
- Encouragement for team members to review the merged pull request and provide feedback.

Meeting Conclusion:

- Steve thanked everyone for their participation and contributions.
- The meeting concluded with a positive note on the ongoing implementations and the significant progress being made.

2024-07-04 Meeting Summary

Participants:

- Speaker 1 (Steve)
- Speaker 2 (Patrick)
- Speaker 3 (Joe)
- Speaker 4 (Marcus)
- Speaker 5 (Anne)

- Speaker 6 (Mark)
- Speaker 7 (Other Participants)

Key Points Discussed:

1. Introduction and Agenda:

- Steve welcomed participants and reiterated the meeting recording policy and IP contributions disclaimer.
- Mentioned the upcoming UNCFACt forum and plenary, highlighting sessions involving UNTP.

2. New Participants:

- Mark, Rocky, and Tomas from Canada introduced themselves as potential implementers in the plastics value chain.
- Anne and Dow from Canada also introduced themselves, working on digital product passports.

3. Pull Request Reviews:

- **Digital Product Passport Update:**
 - Suzanne's PR suggesting a single unique identifier for products instead of an array was discussed.
 - Agreement to merge after minor adjustments (e.g., removing the 's' from identifiers).
- **Trust Graphs and Wallets:**
 - Suzanne's PR on trust graphs and wallet presentations was not merged.
 - The team agreed to avoid technical dependencies on wallets, focusing instead on a publish and discover architecture.

4. Discussion on JSON-LD and JSON Schema:

- Steve shared insights on the use of JSON-LD and JSON Schema for managing vocabularies and credentials.
- Emphasis on making life easier for implementers by providing clear schemas and context files.
- The goal is to construct meaningful transparency graphs for verifiers.

5. Conceptual Model and Transparency Graph:

- Discussion on the conceptual model showing relationships between entities like products, organizations, and facilities.
- The importance of identifiers and the relationship between entities was emphasized.
- The aim is to create a transparency graph that can be easily consumed and interpreted.

6. Future Steps:

- Plans to finalize and publish updated models for digital product passports, conformity credentials, and traceability events.
- Encouragement for participants to review and provide feedback on the proposed changes.

Action Items:

- **Steve:** Finalize and merge the PR for the single unique identifier and update the digital product passport model.

- **Team:** Review and provide feedback on the proposed updates to the models and context files.
- **Steve:** Prepare pull requests to align models with the discussed conceptual framework.

Next Steps:

- Continue refining the models and schemas to ensure they are implementable and interoperable.
- Prepare for testing the models with various extensions and real-world use cases.

2024-06-27 Meeting Summary

Date: June 27, 2024

Participants:

- Steve
- Gerhard
- Zach
- Susanne
- Harley
- NIS
- Virginia

Agenda:

1. Review of Public Comments on Recommendation 49
2. Timeline and Plan for Addressing Comments
3. Discussion on Specific Comments
4. Digital Identity Anchor Credential
5. Governance and Versioning of Standards

Key Points:

1. Introduction and General Updates:

- Steve welcomed everyone and emphasized the importance of contributions to the project.
- The public review period for Recommendation 49 has concluded, and comments have been circulated via email.

2. Review of Comments on Recommendation 49:

- Comments varied from editorial to substantive, with significant input from Gerhard.
- The team has a weekend to draft responses and update the document before the plenary meeting in two weeks.
- Steve asked for volunteers to help review and respond to the comments. Zach and Speaker 2 offered assistance.

3. Discussion on Specific Comments:

- Gerhard suggested prioritizing substantive comments over editorial ones.
- Some comments highlighted confusion between transparency and traceability in the document's title and content.
- The team plans to consolidate and prioritize comments, creating a response log for internal review over the weekend.

4. Digital Identity Anchor Credential:

- Introduction of a new credential to link digital identities with authorized registers (e.g., Australian business number).
- Discussion on aligning with verifiable legal entity identifiers (VLEI) and ensuring compatibility with existing standards.

5. Governance and Versioning of Standards:

- Presentation of a diagram to illustrate the governance and extension of digital product passports and related credentials.
- Agreement to maintain long-term versions and ensure stability of standards and references.
- Discussion on the inclusion of external vocabularies (e.g., schema.org) alongside UN-specific vocabularies.

6. Issues and Actions:

- Several tickets and issues were reviewed, including automated policy execution and maintaining versions of standards.
- Harley volunteered to present a demo on trust graphs and shackle rule validation in four weeks.

Next Steps:

- Address and finalize responses to public comments on Recommendation 49 by Monday.
- Update and publish the digital identity anchor credential after resolving outstanding issues.
- Continue discussions on governance and versioning, incorporating feedback from the broader standards community.
- Prepare for the next meeting, focusing on traceability events and further issues.

Action Items:

- Zach and Steve to create an integrated comments log for Recommendation 49.
- Steve to update the project page with relevant links and descriptions.
- Harley to prepare a demo on trust graphs for the meeting in four weeks.
- Team to review and provide feedback on the governance diagram and proposed standards extension approach.

This summary captures the main points and action items from the meeting. If any participant has additional comments or corrections, please share them before the next meeting.

2024-06-19 Meeting Summary

Participants:

- Speaker 1 (Chair)
- Speaker 2 (Patrick)
- Speaker 3 (Zach)
- Speaker 4 (Phil)
- Speaker 5 (Steve)
- Speaker 6 (Nis)
- Speaker 7 (Juliet)
- Speaker 8 (Dr. Wang)

Key Points Discussed:

1. Implementation Tools and Reference Implementations:

- Discussed the distinction between implementation tools and reference implementations.
- Emphasis on the need for a toolkit to help implementers test and ensure interoperability with UNTP.
- Concerns about long-term funding for test suites and the potential for community contributions.

2. Rendering Methods for Verifiable Credentials:

- Debate on whether to mandate a specific rendering method.
- Agreement to use a “should” directive for rendering methods, specifying HTML as the primary method but allowing for additional methods.
- Adjustments to the wording to reflect this approach.

3. Conformity Credential Alignment:

- Discussion on aligning conformity credentials with the VCDM (Verifiable Credential Data Model).
- Decision to manage status externally rather than within the credential to avoid reissuing credentials for status changes.
- Agreement on using existing VCDM fields where applicable and not duplicating fields within the credential.

4. Identity Resolver Naming:

- Phil suggested renaming “digital link resolver” to “identity resolver” to avoid confusion and potential trademark issues.
- Agreement to adopt “identity resolver” as it better describes the function.

5. Site Restructure and Business Case Promotion:

- Site restructuring to align with the five-pillar architecture model and updated component names.
- Elevated the business case section to highlight the importance of commercial incentives and funding for sustainable supply chains.

6. Versioning of Context Files:

- Discussion on the appropriate granularity for context files.

- Consensus on having separate context files for each core data credential type to simplify management and maintainability.
- Emphasis on aligning versioning of data models, schemas, and context files.

7. Use of Jargon Tool for Model Generation:

- Overview of the Jargon tool used for generating schemas and context files.
- Acknowledgment of the need for high-quality outputs and flexibility in tool usage.
- Open to reassessing the tool's use based on implementation feedback.

Action Items:

- **Patrick and Nis:** Update the conformity credential model to align with VCDM fields and manage status externally.
- **Zach:** Update the wording for rendering methods to reflect the new “should” directive.
- **Steve:** Finalize and merge the PR for identity resolver renaming and site restructuring.
- **Team:** Review and experiment with the Jargon tool to ensure it meets quality expectations for generating context files.

Next Steps:

- Finalize the updates to data models and context files before the next meeting.
- Prepare for discussions on the content of digital product passports and business content in upcoming calls.

2024-06-13 Meeting Summary

Participants:

- Steve (Speaker 1)
- Nis (Speaker 2)
- Zach (Speaker 6)
- Cliff (Speaker 2)
- Patrick (Speaker 3)
- Ksenia (Mentioned)
- John (Speaker 5)
- Suzanne (Speaker 3)

Key Points Discussed:

1. Pull Requests Review:

◦ **Testing Architecture PR by Zach:**

- Discussion on merging Zach's updated testing architecture, which simplifies the previous bullet-heavy document.
- Consensus to merge despite it being in draft to move forward.

- **Mill Test Report PR by Nis:**

- Addressed issue 19 regarding steel mill test reports conforming to schema.
- Decision to close and start fresh aligning with the layered architecture approach.

- **Digital Livestock Passport:**

- A practical extension example for the Australian digital livestock passport project.
- Closed PR without merging, left a comment on the required alignment.

- **Context and Schema Files by Nis:**

- Added basic context and schema definitions to aid in linked data implementation.
- Agreement on merging the PR despite the incomplete schema, with an action to improve alignment.

- **Reference Implementations by Zach:**

- Deferred merging Zach's reference implementations pending more complete content.

2. Architecture Overview Discussion:

- Presented a diagram outlining the components of the UNTP specifications.
- Discussed sections including Digital Identity Anchor, Decentralized Access and Control (DAC), and semantic understanding of data.
- Emphasis on practical guidance using existing technologies like GLEIF's Verifiable Legal Entity Identifier and Trust Over IP's Trust Registry Protocol.

3. Methodology for Model and Schema:

- Addressed the collision of top-down (model-driven) and bottom-up (instance-driven) methodologies.
- Decision to use Nis's practical instances to guide model updates and schema generation for alignment.

4. Additional Business:

- Agreement on renaming "trust graph" to "transparency graph" to avoid confusion.
- Planned actions to update documentation, align naming conventions, and ensure completeness of the context and schema files.

Action Items:

- **Steve:** Update the jargon generator to produce schema and context files that align with Nis's examples.
- **Nis:** Assist with reviewing and validating the updated model-generated artifacts.
- **Steve:** Merge the updated architecture overview and realign website content accordingly.
- **John and Suzanne:** Continue contributions to decentralized access control and digital identity anchor discussions.
- **Team:** Prepare for testing the digital product passport model in various industry contexts.

The next meeting is scheduled in two weeks for further technical reviews and business discussions on the practical implementation of the digital product passport.

2024-06-05 Meeting Summary

Attendees:

- Steve (Speaker 1)
- Virginia (Speaker 3)
- Jason (Speaker 5)
- Patrick (Speaker 2)
- Marcus (Speaker 4)
- Other unidentified speakers

Key Points Discussed:

1. Meeting Organization and Participation:

- Steve acknowledged the need to increase participation in meetings through better marketing.
- Reminded attendees that this is a UN meeting and contributions are considered UN IP.
- Steve mentioned that meetings are recorded and transcriptions are published.

2. Meeting Transcription and Summary Process:

- Steve shared updates on how meeting transcriptions and summaries are managed.
- Introduced a table format for meeting summaries with video transcripts, text transcripts, GPT summaries, and one-sentence summaries for quick reference.

3. Pull Requests and JSON Schema vs. JSON-LD Context:

- Discussion on handling pull requests and differences between JSON schema (structure) and JSON-LD context (meaning).
- Steve shared a detailed explanation and a diagram to clarify these differences, using examples like a verifiable credential describing a traceability event for a bale of cotton.

4. Challenges with JSON-LD Context and Semantic Interoperability:

- Steve highlighted the challenges in mapping complex, abstracted data models to meaningful terms in a consistent way.
- Illustrated the difficulty with an example involving transport means and IMO numbers, emphasizing the problem with abstract structures in JSON-LD context files.

5. Discussion on Governance and Granularity:

- Patrick and Marcus contributed to the discussion on how to manage the complexity and granularity of context files.

- Marcus suggested using catalog entries to manage multiple schemas and context files, which could help in maintaining semantic integrity and version control.
- The need for proper governance to ensure correct mappings and avoid wrong semantic interpretations was emphasized.

6. Principles for Managing Context Files:

- Agreement on keeping context files small, semantically correct, and aligned with specific use cases.
- Steve proposed focusing on manageable granularity for context files, suggesting one context file per credential schema to simplify governance and changes.

7. Future Steps:

- Plan to open an issue for further discussion on mapping complexity and balance.
- Aim to document guiding principles for UNTP governance and implementers.
- Acknowledgment that more discussion and iteration are needed to refine the approach.

Action Items:

- Steve to draft guiding principles for context file management.
- Open an issue for further discussion on mapping complexity and balance.
- Follow-up discussions to refine the approach based on feedback and further exploration.

Meeting Conclusion:

- Steve thanked everyone for their participation and contributions.
- The meeting ended with an acknowledgment of the need for ongoing collaboration to address the challenges discussed.

2024-05-30 Meeting Summary

Attendees:

- Zachary
- Stefano
- Michael
- Joe
- Bill
- Peter
- Various team members

Key Points Discussed:

1. Pull Requests:

- Zachary presented his closed pull request related to test architecture. He acknowledged the need to update it based on Steve's feedback and plans to do so by next week.
- Discussion on merging half-baked pull requests to ensure progress and avoid stagnation.

2. Issues:

- The team has 50 open issues, with a tendency to create more than they resolve.
- **Selective Disclosure Use Cases and Requirements:** This issue is on hold, with a potential demo for the UN forum being considered.
- **PDF Generator Issue:** Assigned to three people, none of whom were present. It was suggested to put a note for easy conversion of GitHub sites to PDF documents and possibly mark the issue as pending close.
- **Right to Repair Regulations:** Stefano highlighted the importance of aligning with EU regulations on this matter to enhance document alignment. He volunteered to draft relevant verbiage.
- **Depth of Product Information:** The team discussed the necessity of tracking both upstream and downstream information, debating the practical limits and methods for maintaining depth without overcomplicating the process.
- **Discovery Mechanism:** Discussion on the challenge of linking product information if the physical identifier is lost. No immediate solution was found, and the issue might be closed without action or tagged for future consideration.

3. Technical Discussions:

- The challenge of maintaining a dynamic and evolving digital product passport was discussed, with considerations on how to append information without altering the original document.
- There was a consensus on the importance of linked product passports, with each tier in the supply chain responsible for creating and maintaining their own passports and linking them appropriately.
- Verification and validation processes for credentials were discussed, with the need to detail steps for verifying issuers, data, schema, and status.
- Discussion on certificates of conformity and the need for a practical way to refer to specific sections within a comprehensive conformity document.

4. Future Actions:

- Explore solutions for appending information to digital product passports without compromising the original data.
- Open new tickets to address specific downstream right-to-repair solutions.
- Investigate the potential need for a central registry or blockchain solution to ensure the longevity and accessibility of digital product passports.
- Ensure alignment with existing standards and leverage the work done by related bodies.

Conclusion: The meeting covered a range of issues from pull requests to regulatory alignment and the technical challenges of digital product passports. The team agreed on the need for continued exploration and development in these areas, with specific action items identified for follow-up. The meeting ended with the decision to be more aggressive in closing unresolved issues to maintain a manageable list.

2024-05-23 Meeting Summary

Participants: Virginia, Steve, Patrick, Zach, Gerhard, Marcus, John, Virginia, Joe, Phil, Harley, Juliet, and others.

Key Points Discussed:

1. Attendance and Meeting Logistics:

- Various participants joined from different locations, including Steve on a yacht in Corfu.
- Technical difficulties were experienced by some participants with the meeting link.

2. Meeting Overview:

- The meeting was recorded and contributions are governed by a UN project.
- The agenda focused on pull requests, updates to tickets, and related discussions.

3. Pull Requests and Sample File Updates:

- A pull request discussed was about updating a sample file for the digital product passport.
- The sample file was initially populated with real data from a participant's wife's company, which was then genericized.
- Agreement to merge the pull request after making it align better with the VC data model.

4. Discussion on Naming and Structuring Digital Product Passports:

- Debate on the appropriate terminology for types of credentials and subjects within the digital product passport.
- Suggestions included keeping terms like "product passport" consistent and aligned with the data model.
- The group discussed the implications of using terms like "digital" in various contexts.

5. Alignment with the VC Data Model:

- Agreement that the digital product passport should not compete with but rather use the VC data model.
- Proposed changes include aligning the example data and the data model, and updating the website accordingly.

6. Trust Graph vs. Transparency Graph:

- Extensive discussion on the terminology to describe the assessment of linked data within digital product passports.
- Alternatives considered included "trust graph," "provenance graph," "evidence graph," and "transparency graph."
- Consensus leaned towards using "transparency graph" to avoid confusion and to better align with the project's goals.

7. Reference to W3C Provenance Model:

- Marcus suggested using the W3C Provo ontology as a framework for describing the evidence or transparency graph.
- This approach would help in structuring and querying the data to provide a clear lineage and validation of the information.

8. Action Items:

- Steve to make the discussed changes to the pull request and update the data model and website.
- Participants to review the W3C Provenance Model and consider its integration into the project specifications.

- Further refinement and alignment of terminology and models in future discussions.

Next Steps:

- Follow-up on the discussed changes and updates.
- Continued refinement of terminology and alignment with established data models.
- Ongoing review and merging of pull requests as per the consensus reached.

Closing:

- The meeting concluded with an acknowledgment of the productive discussion and the clarity gained on several topics. Participants were thanked for their contributions.

For more detailed information, the full meeting recording and notes are available for review.

2024-05-16 Meeting Summary

Date: May 16, 2024

Participants: Various speakers including Steve, Phil Archer, Nis, Suzanne, and others.

Key Points Discussed:

1. Introduction and IP Reminder:

- Contributions to the project are under the UNIP framework.
- Agenda includes discussing outstanding pull requests, ongoing tickets, and the relationship between schema, context files, and vocabularies.

2. Pull Requests Review:

- **Minor Typo Fix:** A simple typo correction was merged without objections.
- **Example Update:** An update to the example in the passport and conformity credential sections was discussed. Concerns about using a real company's product (buyacre.com) were raised, suggesting a switch to imaginary examples to avoid IP issues.

3. Test Architecture Proposal:

- Introduction of a three-tier conformance testing model: technical interoperability, schema testing, and business workflow testing.
- Emphasis on ensuring must/should requirements are testable.
- Discussion on using existing W3C test suites for core elements and defining additional tests for extensions.

4. Linked Data and JSON-LD Context Files:

- Importance of linked data for ensuring consistent meaning across multiple instances.

- Strategy to keep JSON-LD context files light and map only necessary elements to avoid complexity and incorrect mappings.
- Agreement to develop the data model first and then map to established vocabularies.

5. Issues and Tickets:

- Several issues tagged as pending closure after aligning models with VCDM.
- Ongoing discussions on specific issues, with updates and resolutions expected in future meetings.

6. External Collaborations and Standards:

- Steve presented at the Surpass kickoff, discussing alignment with the European Commission's efforts on product passports.
- Suzanne highlighted the need to align with JTC 24 standards, focusing on product passport issuance and upstream supply chain data integration.
- Proposal to establish a formal liaison with JTC 24 through the UN.

Actions and Next Steps:

1. Steve:

- Work with Nis to update example models with non-proprietary products.
- Align data models with VCDM and prepare for pilot implementations.
- Follow up on establishing a formal liaison with JTC 24 through the UN.

2. Phil Archer:

- Review any references to secure QR codes and update the test suite as needed.
- Monitor and update the alignment with JTC 24 standards.

3. Suzanne:

- Provide guidance on establishing a liaison with JTC 24.
- Monitor JTC 24 activities and report back on potential divergences or necessary alignments.

4. All Participants:

- Review the updated data models and provide feedback in the next meeting.
- Engage in discussions on trust graphs and interoperability in upcoming calls.

Closing Remarks:

- Meeting ended 15 minutes early, with participants appreciating the extra time. The next meeting will focus on updates to the data models and further discussions on trust graphs.

2024-05-09 Meeting Summary

Attendees:

- Speaker 1 (Steve)
- Speaker 2 (Patrick)
- Speaker 3 (Virginia)
- Speaker 4 (John)
- Speaker 5 (Marcus)
- Speaker 6 (Unidentified)
- Speaker 7 (Unidentified)

Agenda:

1. Review of Outstanding PRs
2. Discussion on Key Tickets
3. Assignment Updates

Key Points:

1. General Updates:

- Steve is currently anchored in Hvar, Croatia.
- Meeting participants are from various time zones, with some joining late at night.

2. Recording and Contributions:

- Meeting is recorded and contributions are for UNIP.
- Participants are reminded that if they do not wish to contribute to UNIP, they should refrain from sharing ideas.

3. Review of PRs:

- Only one pull request was discussed, which focused on enriching the content for conformity credentials.
- The PR aims to align with existing business requirement specifications and the logical model of digital product conformity certificates.
- Discussion about aligning fields with the VC (Verifiable Credentials) data model, particularly the "issuer" field.

4. Feedback on PRs:

- Nis provided feedback on the PR, suggesting alignment with the VC data model.
- Discussion on avoiding duplication of information and using complex objects in the VC issuer field.
- Decision to merge the current PR and address alignment in subsequent revisions.

5. Trust Graphs:

- Discussion led by John on the concept of trust graphs and the complexity of defining absolute measures of trustworthiness.
- Agreement that trust decisions should be subjective and context-dependent, rather than protocol-defined scores.

6. Rendering Methods:

- Patrick discussed the use of OCA (Overlays Capture Architecture) for rendering credentials, supporting multiple languages and additional metadata.
- Emphasis on separating rendering logic from the data integrity of credentials.

7. Multilingual Support:

- Debate on whether multilingual support should be embedded within the credential or handled through external overlays.
- Consensus on using governed presentation layers for multilingual support to keep credentials simple and maintainable.

8. Action Items:

- Align digital product passport models with the VC data model.
- Remove the scoring elements from the digital product passport to avoid complications and ensure clarity.
- Write a ticket to formally propose the removal of scoring from the digital product passport (John).

9. Other Discussions:

- Mention of the Australian Agriculture Traceability Protocol as a model for implementing similar initiatives.
- Steve highlighted a new publication from the Australian Government on agricultural traceability, noting the influence of UNTP.

10. Closing Remarks:

- Steve thanked participants and emphasized the importance of aligning with the VC data model.
- Next steps include continuing work on assigned tickets and discussing progress in the next meeting.

Next Meeting:

- Participants will continue with their assigned tasks and discuss further progress in the following week.

This summary captures the main points and action items from the meeting, ensuring clarity on the next steps and ongoing discussions.

2024-04-25 Meeting Summary

Meeting Start and Introductions:

- The meeting was initiated by Speaker 1, who took over the role of Master of Ceremony due to Steve being on a flight.
- Attendance included a significant Australian contingent despite it being a public holiday in Australia.
- Steve is traveling to China to coordinate supply chain pilot projects in the battery and critical mineral manufacturing process.

Agenda and Objectives:

- Review and process of open pull requests.
- Assignment and movement of stale issues.
- Emphasis on facilitating broader collaboration within the group.
- Encouragement for discussions to be taken offline or into Slack channels unless mission-critical.

Key Points Discussed:

1. Pull Requests:

- Three pull requests were reviewed.
- Major update to the traceability event schema by Steve was discussed, aligning more closely with the GS1 EPCIS standard.
- Gerhard suggested creating an issue to compare the current model with the existing data models used in other sectors like animal track and trace and textiles.
- Another pull request involved adding a governance section to describe the collaboration process.
- A minor but potentially controversial pull request to remove an "out of place header" was discussed. The group decided to create a ticket to further explore the verifiability of identifiers before merging the pull request.

2. Issues:

- Several issues were discussed, including the addition of page listing referenced standards, digital product passport sample files, and UNTP extensions methodology.
- Gerhard highlighted the importance of maintaining interoperability by having a concise data model applicable across different industries.
- Marcus and Virginia emphasized the need for clear guidance on how extensions fit within the core data structures and the governance process for managing these extensions.

Action Items:

- Creation of issues for comparing data models and verifying identifiers.
- Assignment of tasks to specific individuals, including Zach taking on the task of providing a digital product passport sample file.
- Further discussion on trust graph validation and the relationship between extensions and the core UNTP specifications.

Closing Remarks:

- The meeting concluded with thanks to Zach for leading the session in Steve's absence.
- A reminder for continuous collaboration and the importance of adhering to the process for pull requests and issue discussions.

This summary captures the main points and action items from the meeting, providing a concise overview for those who were unable to attend.

2024-04-18 Meeting Summary

Participants:

- Speaker 1
- Nis (Master of Ceremonies)
- Phil
- Susanne
- Steve
- Zach
- Michael
- Gerhard

Key Points Discussed:

1. Reminder on Contributions:

- Contributions made to the GitHub repository are contributions to United Nations Intellectual Property (UN IP).
- External specifications like GS1 and W3C can be referred to, but unique content belongs to UN IP.

2. Streamlining Specification Sections:

- Discussion on the need to streamline the specification sections due to too many headings.
- Proposal to handle this later in the normal order of pull requests and issues.

3. Pull Requests:

- **Pull Request 57 by Phil:**
 - Focused on identifying discoverability and the pervasiveness of scanners and software.
 - Positive feedback and agreement to build incrementally on the contributions.
- **Pull Request 59 by Zach:**
 - Simplified goals based on previous discussions, addressing issue 53.
 - Merged with no objections.
- **Pull Request by Steve:**
 - Added verifiable credentials section, discussing business requirements and existing technical specifications.
 - Emphasis on conservative issuance and flexible verification.
 - Merged with no objections.

4. Issues Discussion:

- **Issue 9 (Verification and Trust Graphs):**
 - Proposal to use business-friendly examples and diagrams to explain trust graphs.
 - Three common patterns identified:
 - a. Same identity across different credentials.
 - b. Conformity credential linked to claim.

- c. Certifier accredited by a trusted third party.
- Commitment to create a PR with these examples for further discussion.

5. General Agreement:

- Need for more use cases to test the scenarios and specification.
- Encouragement for more participants to lean in and help move forward with the tasks.
- Importance of balancing detailed discussions with progress on issues.

Actions and Assignments:

- **Steve and Suzanne:** Collaborate on creating examples and diagrams for the trust graph patterns.
- **Phil:** To work on aligning terminologies (must, should, may) with IETF standards.
- **All participants:** Add comments on issues directly in GitHub for better tracking and follow-up.

Next Steps:

- Assign issues before discussions in the next meeting.
- Ensure more focused discussions to cover more issues efficiently.

Closing Remarks:

- Commitment to improving the pace of progress while bringing everyone along on the journey.
- Meeting adjourned with a plan to implement better structure in future meetings.

This summary captures the essence of the meeting, the key decisions made, and the next steps agreed upon. If you need any specific details from the transcript, please let me know!

2024-04-11 Meeting Summary

Attendees:

- Steve
- Patrick
- Susanna
- Virginia
- Susan
- Becky
- Nancy
- Zach
- Carolyn
- Joe
- Stephen

- Other Participants

Main Discussion Points:

1. Introduction and Setup:

- Initial greetings and setting up systems.
- Discussion on the global timing of the meeting to accommodate different time zones, primarily focusing on American and Canadian colleagues.

2. Podcast Mention:

- Mention of a podcast with Darrell O'Donnell and the suggestion to share the link in the Slack channel.

3. Meeting Formalities:

- Reminder that contributions are for U.N. IP and that the meeting is recorded.
- Standard procedure involves reviewing open pull requests and discussing issues.

4. Digital Product Passport (DPP) Development:

- Emphasis on the need to start looking at industry use cases.
- Discussion on the GBA digital product battery passport and ISO standard for digital product circularity.
- Agreement to merge changes related to the product passport data model.

5. Use Cases and Industry Pilots:

- Discussion on industry-specific pilots for testing the feasibility and value of the DPP.
- Mention of upcoming pilots in agriculture and critical raw materials.
- Carolyn shared a slide explaining the value chain and the application of the UNTP framework.

6. Trust and Credential Verification:

- Discussion on trust registries and methods for verifying the trustworthiness of credential issuers.
- Different approaches were considered, including the use of DID (Decentralized Identifiers) and linked credentials.
- Example of the Australian Business Register and how it could issue credentials to businesses.

7. Verifiable Credentials and Exchange Models:

- Debate on the best practices for exchanging verifiable credentials, whether wallet-to-wallet or through a publish and discover model.
- Reference to a project that involved publicly discoverable credentials and lessons that could be relevant for UNTP.

8. Technical Infrastructure and DID Methods:

- Concerns about the infrastructure for DID web and potential lock-in with service providers.
- Suggestion to develop recommendations for DID methods suitable for different use cases, such as small businesses and product identifiers.

9. Upcoming Tasks and Assignments:

- Agreement to work on a prototype for linked credentials and identity verification.
- Decision to use Slack more actively for offline discussions to expedite progress.

Action Items:

- Patrick to write a summary of lessons from the discussed project and how they might impact UNTP.
- Stephen Curran to work on a prototype for verifying linked credentials.
- Create a ticket for recommending DID methods for different use cases.
- More active use of Slack for ongoing discussions and resolving tickets.

Next Meeting:

- The next meeting will be held at a time more convenient for European participants.

Additional Notes:

- Suzanne from the World Economic Forum and the Global Battery Alliance participated for the first time.
- Stephen Curran introduced a new DID method called Trusted Web, which could be relevant for the project's needs.

This summary captures the key points and discussions from the meeting on April 10, 2024.

2024-04-04 Meeting Summary

Attendees:

- Steve (Speaker 1)
- Nisht (Speaker 2)
- SAC Representative (Speaker 8)
- Michael Shea (Speaker 9)
- Virginia (Speaker 5)
- Brett (Speaker 7)
- Gerhard (Speaker 3)
- Joe (Speaker 4)
- Ashley (Speaker 6)

Key Points Discussed:

1. Recording and IP Contribution:

- **Steve** reminded everyone that contributions are voluntary, and IP is contributed to the UN.
- A recording will be posted for those who couldn't attend.

2. Digital Product Passport (DPP):

- **Steve** requested additional discussion time on DPP updates.
- Issues with pull requests (PR) were discussed, particularly around supply chain depth clarification.
- Agreement to merge a PR and address depth in a subsequent PR.

3. Pull Requests and Issues:

- A PR from **SAC Representative** was discussed. It was agreed to merge it with follow-up clarifications.
- Discussion on identifiers for entities and products, emphasizing the need for multiple identifiers (e.g., GLN, ABN, DID) and the ability to verify them.
- Importance of having robust claims for product categories and items, considering changes over time.

4. Granularity in Product Claims:

- **Virginia** and **Gerhard** led a detailed discussion on handling product claims at different levels (e.g., product class vs. individual items).
- Emphasized the necessity of batch numbers and serialized identifiers for traceability and integrity.

5. Verifiable Credentials and Technical Specifications:

- Debate on the approach for verifiable credentials and the need for implementation guidelines.
- Discussion on interoperability, technical recommendations, and the balance between specificity and flexibility.
- Agreement to draft business requirements to guide technical recommendations.

6. Rendering Templates for Verifiable Credentials:

- **Ashley** presented on using rendering templates within credentials.
- Discussion on embedding templates vs. linking to external sources, considering privacy, performance, and integrity.

7. Next Steps and Actions:

- **Steve** to draft business requirements for verifiable credentials.
- **Nis** and others to provide feedback and draft a pull request based on these requirements.
- Further discussion on specific technical choices and their rationale.

Action Items:

- **Steve** to draft and post business requirements for verifiable credentials.
- **All relevant parties** to prepare and review pull requests related to DPP updates and verifiable credentials.
- Continue discussions on granularity of product claims and implementation guidelines.

Conclusion: The meeting focused on refining the process for handling digital product passports and verifiable credentials, ensuring robust and interoperable solutions. The importance of clear business requirements to guide technical decisions was emphasized, and specific actions were assigned to move forward with these discussions.

2024-03-28 Meeting Summary

Attendees:

- **Stephen (Speaker 1)**
- **Kevin (Speaker 13)**
- **Nancy Norris (Speaker 5)**
- **Stephen Curran (Speaker 14)**
- **Jason (Speaker 7)**
- **Phil (Speaker 2)**
- **Virginia (Speaker 3)**
- **Christophe (Speaker 12)**
- **Michael (Speaker 10)**
- **Zach (Speaker 12)**
- **John (Speaker 9)**
- **Peter (Speaker 8)**

Key Points Discussed:

1. Meeting Timing Adjustments:

- Adjusted to accommodate participants from different time zones, especially from Canada and the U.S.
- Noted appreciation for the flexibility, despite it being late for some European participants.

2. Welcome and Introductions:

- Introduction of new participants from North America.
- Brief introductions by Nancy Norris and Stephen Curran highlighting their roles and work on verifiable credentials.

3. Recording and Standards Development:

- Meeting is being recorded.
- Emphasis on the focus on standards development rather than commercial products.
- Contributions to the meeting are considered as contributions to the United Nations Intellectual Property Library.

4. Digital Product Passport (DPP):

- Discussion on the importance of focusing on the DPP due to upcoming pilots in Australia and the EU.
- Emphasis on business attention needed for the DPP structure.

5. Claims and Evidence:

- Discussion on how to handle claims at the SKU, batch, and facility levels.
- Recognition of the need to differentiate between product-level and batch-level claims.
- Debate on the inclusion of benchmark values and references in the claims.

- Some participants argued for the inclusion to provide context and comparability.
- Others suggested it could be out of scope and should be handled by third-party verifiers.

6. Granularity of Claims and Evidence:

- Addressed the challenge of reconciling claims at the shipment level with evidence at the facility level.
- Discussed the potential for greenwashing if facility-level evidence is used to support product-level claims without proper verification.

7. Product vs. Batch Passports:

- Consideration of whether to maintain separate passports for products and batches.
- Discussed the possibility of inheriting claims from product to batch levels.
- Agreed on the need for optional structures to support different use cases.

8. Vocabulary and Ontology:

- Suggested a need for rigorous definition and management of the taxonomy and ontology of claims.
- Potential overlap between the data model and the vocabulary of sustainability claims.

9. Next Steps:

- Stephen to update the ticket with the consensus from the discussion.
- Further review and testing of the data model with real use cases to ensure its implementability.

Action Items:

- Stephen to update the data model and ticket based on the discussion.
- Participants to review the updated model and provide feedback.
- Plan to test the model with sample certificates and real-world scenarios.

Closing:

- Meeting concluded with a reminder to stick to time limits for the benefit of all participants.

Please let me know if there are any specific details or additional information you would like to include in the summary.

2024-03-15 Meeting Summary

Participants:

- Steve
- Phil
- Nis
- Other unnamed speakers

Key Points Discussed:

1. Policy Document Submission:

- The policy document was successfully submitted to the Secretariat and forwarded to the Bureau.
- Approval from Bureau members is in progress, with public release anticipated soon.

2. Meeting Frequency:

- Discussion on whether to hold meetings weekly or fortnightly.
- Consensus leaned towards weekly half-hour meetings to ensure consistent progress and accountability.

3. Tech Specifications and PRs:

- Focus to shift to tech specifications following the policy document submission.
- Nis discussed several pull requests (PRs) for practice and refinement.
- Agreed on a structured approach to reviewing and merging PRs.

4. GS1 Standards and UNTP:

- Debate on the inclusion of GS1 standards and the relationship with UNTP.
- Decision to potentially host information on GS1's own page and link it from the UNTP site.

5. Editing and Contributing via GitHub:

- Demonstration on how to edit pages, create issues, and make pull requests on GitHub.
- Emphasis on using the "Edit this page" feature for ease of contribution.

6. Action Items:

- Participants to self-assign tickets on GitHub and contribute to issues and pull requests.
- Continuous monitoring and support via Slack for any technical issues.

7. Miscellaneous:

- Acknowledgment of contributions to the policy document.
- Future meetings to follow a structured process focusing on PRs and issues.

Next Steps:

- Weekly meetings to continue with a focus on technical specifications.
- Participants to actively engage in GitHub for issue tracking and pull requests.
- Continued collaboration and support to ensure progress on project goals.

2024-02-29 Meeting Summary

Date: February 29, 2024

Participants:

- Speaker 1 (Steve)
 - Speaker 2 (Virginia)
 - Speaker 3 (Christophe)
 - Speaker 4 (Nes)
 - Speaker 5 (Brett)
 - Speaker 6 (Jerry)
 - Speaker 7 (Rakesh)
 - Speaker 8 (Peter)
 - Speaker 9 (Unnamed participants)
-

Key Points Discussed:

1. Introduction and Updates:

- Steve (Speaker 1) is still in Europe and provided an update on his encounters in Europe, including attending the GS1 Global Forum and OECD Textile and Leather Due Diligence Forum. He emphasized the alignment of GS1's initiatives with the group's goals and the opportunities for collaboration.

2. European Meetings:

- GS1 Global Forum: Discussed their customers' challenges and the potential for cooperation in the use of resolvable identifiers and digital product passports.
- OECD Forum: Major brands like Adidas are struggling with due diligence requirements and need a standard to push through their supply chain.
- Surpass Program: EU's initiative for pilot projects in various sectors, which is seen as complementary to UNDP.
- DG Grow: European Commission's interest in complementary end-to-end pilots.

3. Feedback on Europe Meetings:

- The feedback received from meetings in Europe was generally positive, indicating a good alignment with the group's objectives and a strong appetite for collaboration on digital product passports and related initiatives.

4. Discussion on UNDP and EU DPP:

- Virginia highlighted the need to base the cross-border environmental passport on UNDP and mentioned that UNEP is interested in cooperating but prefers to base their work on UNDP.

5. Recommendations Structure:

- The group discussed the structure of the recommendations in their document, deciding on having recommendations after the challenges section, aligning with standard UN document structures.

- Emphasized the importance of making digital product passports resolvable and verifiable and the role of identifier schemes.

6. Challenges Section:

- Agreement to shorten the challenges section to make the document more readable and concise, aiming for about two pages.

7. Next Steps:

- Steve will rework Section 1 based on the feedback, shorten the challenges, and send out the updated version by Monday for final review before submission to the Secretariat by the end of the week.

Action Items:

- Steve to revise Section 1 and shorten the challenges section.
- Send the revised document to the team by Monday.
- Team to review and provide feedback before the next meeting on Thursday.
- Finalize the document for submission by Friday.

Meeting Adjourned:

- Meeting concluded with a plan to reconvene on Thursday for final review.

This summary captures the key points and actions from the meeting, ensuring that all participants are aligned on the next steps and responsibilities.

2024-02-15 Meeting Summary

Participants:

- Speaker 1 (Chair)
- Speaker 2 (Virginia)
- Speaker 3 (Gerhard)
- Speaker 4 (Rakesh)
- Speaker 5 (Stefano)
- Speaker 6
- Speaker 7 (Joe)
- Speaker 8
- Speaker 9
- Speaker 10

Agenda:

1. Review and focus on the policy document draft.
2. Discuss feedback and make necessary adjustments.
3. Prepare for final iteration of sections before the public review.

Key Points Discussed:

1. Policy Document Review:

- The meeting primarily focused on the policy document draft instead of GitHub issues.
- The urgency to finalize REC 49 for the UN plenary in July was emphasized. The document needs to complete a two-month public review starting early March.

2. Feedback and Structural Changes:

- Feedback from UN Secretariat suggested separating recommendations to member states (Section 1) from those to industry actors (Section 2).
- Virginia's recent edits include:
 - An introduction explaining the purpose of Recommendation 49.
 - A section detailing the UNTP and its challenges in a table format.
 - Clarification on roles and opportunities in Section 2.

3. Content Adjustments:

- Speaker 2 pointed out the need for an explanatory section on UNTP.
- Speaker 1 shared insights from discussions with WTO member state delegates, highlighting the importance of simplifying the document's language and message.
- Stakeholder mapping and visual aids were suggested to clarify the focus on different audiences.

4. Technical and Terminological Clarifications:

- Debate on the term "protocol" concluded with keeping the term but clarifying its meaning in the context of the document.
- Replace "ESG" with "sustainability" to avoid political connotations and ensure clarity.

5. Strategic Alignment:

- Rakesh emphasized aligning the document with existing multilateral frameworks (G20, OECD) and strategic objectives of countries.
- Highlighting benefits such as harmonization and reduction of industry burden to appeal to policymakers.

6. Final Edits and Testing:

- The need for another draft incorporating feedback was agreed upon.
- Testing the revised document on external policymakers for readability and impact before the final iteration.

Action Items:

- **Virginia** to integrate feedback and refine the document.
- **Rakesh** to draft paragraphs on aligning with global initiatives and specifying relevant government departments.
- **Joe and Gerhard** to provide additional input on technical simplifications and stakeholder visual aids.
- **Speaker 1** to circulate an updated draft by Monday for final review and feedback.

Closing Remarks:

- Appreciation for the hard work and contributions from all team members.
- Next steps include refining the document based on today's discussions and preparing for final testing with policymakers.

Next Meeting:

- Date to be determined, expected early next week to review the updated document.

2024-02-01 Meeting Summary

Date: January 25, 2024

Participants:

- Speaker 1 (Steve)
- Virginia
- Peter
- John
- Zach
- Olivia
- Ash
- Kevin
- Nancy
- Brett
- Others

Agenda:

1. Welcome and Introduction
2. Review of Document and GitHub Issues
3. Discussion on Sustainability Pledge and Challenges
4. Collaboration and Coordination in Value Chains
5. Summary of Business Drivers and Technical Challenges
6. Overview of the UNTP Protocol and Design Principles
7. Stakeholder-Specific Challenges and Recommendations
8. Next Steps and Action Items

Key Points:

1. Welcome and Introduction:

- Steve acknowledged participants and outlined the meeting's agenda.
- Mention of ongoing work on the document and the need to populate it further.

2. Review of Document and GitHub Issues:

- A walkthrough of the newly created website for technical information.
- Encouragement to read specific sections of the website for better alignment with the policy document.
- Discussion on the inclusion of contributing experts in the document.

3. Discussion on Sustainability Pledge and Challenges:

- Debate on the name for the sustainability pledge to avoid confusion with the existing textiles and garments pledge.
- Importance of making a pledge that is meaningful and not industry-specific.

4. Collaboration and Coordination in Value Chains:

- Emphasis on the need for tier-one collaboration without imposing technical solutions.
- Highlighting the importance of individual actor implementation for global traceability.

5. Summary of Business Drivers and Technical Challenges:

- Simplification of business drivers to focus on fear of non-compliance and opportunities for market access and price uplift.
- Technical challenges to be detailed in a section correlating with business challenges and confidentiality concerns.

6. Overview of the UNTP Protocol and Design Principles:

- Discussion on the necessity of a new protocol and why existing solutions may not suffice.
- Suggestion to keep technical diagrams and detailed protocol descriptions on the website, not in the policy document.

7. Stakeholder-Specific Challenges and Recommendations:

- Identification of challenges specific to government, industry, and consumers.
- Importance of highlighting regulatory challenges and benefits for governments to ensure relevance and adoption.

8. Next Steps and Action Items:

- Steve and Virginia to act as master editors to streamline the document.
- Focus on creating a draft ready for review and public consultation.
- Continued contributions to the technical website for long-term improvements.

Action Items:

- Steve and Virginia to edit and refine the document based on the discussion.
- Participants to review and comment on the GitHub issues and website content.
- Schedule next meeting for further review and finalization of the draft document.

Closing Remarks:

- Agreement on a two-week period for Steve and Virginia to finalize the draft.
- Next meeting to review the draft and gather final feedback before public consultation.

2024-01-25 Meeting Summary

Date: January 25, 2024

Participants:

- Speaker 1 (Steve)
- Virginia
- Peter
- John
- Zach
- Olivia
- Ash
- Kevin
- Nancy
- Brett
- Others

Agenda:

1. Welcome and Introduction
2. Review of Document and GitHub Issues
3. Discussion on Sustainability Pledge and Challenges
4. Collaboration and Coordination in Value Chains
5. Summary of Business Drivers and Technical Challenges
6. Overview of the UNTP Protocol and Design Principles
7. Stakeholder-Specific Challenges and Recommendations
8. Next Steps and Action Items

Key Points:

1. Welcome and Introduction:

- Steve acknowledged participants and outlined the meeting's agenda.

- Mention of ongoing work on the document and the need to populate it further.

2. Review of Document and GitHub Issues:

- A walkthrough of the newly created website for technical information.
- Encouragement to read specific sections of the website for better alignment with the policy document.
- Discussion on the inclusion of contributing experts in the document.

3. Discussion on Sustainability Pledge and Challenges:

- Debate on the name for the sustainability pledge to avoid confusion with the existing textiles and garments pledge.
- Importance of making a pledge that is meaningful and not industry-specific.

4. Collaboration and Coordination in Value Chains:

- Emphasis on the need for tier-one collaboration without imposing technical solutions.
- Highlighting the importance of individual actor implementation for global traceability.

5. Summary of Business Drivers and Technical Challenges:

- Simplification of business drivers to focus on fear of non-compliance and opportunities for market access and price uplift.
- Technical challenges to be detailed in a section correlating with business challenges and confidentiality concerns.

6. Overview of the UNTP Protocol and Design Principles:

- Discussion on the necessity of a new protocol and why existing solutions may not suffice.
- Suggestion to keep technical diagrams and detailed protocol descriptions on the website, not in the policy document.

7. Stakeholder-Specific Challenges and Recommendations:

- Identification of challenges specific to government, industry, and consumers.
- Importance of highlighting regulatory challenges and benefits for governments to ensure relevance and adoption.

8. Next Steps and Action Items:

- Steve and Virginia to act as master editors to streamline the document.
- Focus on creating a draft ready for review and public consultation.
- Continued contributions to the technical website for long-term improvements.

Action Items:

- Steve and Virginia to edit and refine the document based on the discussion.
- Participants to review and comment on the GitHub issues and website content.
- Schedule next meeting for further review and finalization of the draft document.

Closing Remarks:

- Agreement on a two-week period for Steve and Virginia to finalize the draft.
- Next meeting to review the draft and gather final feedback before public consultation.

2024-01-18 Meeting Summary

Date: January 18, 2024

Participants:

- Speaker 1 (Steve)
- Virginia
- Nis
- Nancy
- Benjamin
- Dr. Wang
- Gregory
- Others

Agenda:

1. Welcome and Introduction
2. Review of GitHub Issues and Editorial Process
3. Verifier Experience and Trust Graph
4. Schema Context and Verifiable Documents
5. Vocabulary and Standards Mapping
6. Versioning and Implementation Profiles
7. Extension Methodology for UNTP
8. Next Steps and Action Items

Key Points:

1. Welcome and Introduction:

- Participants greeted each other and the meeting was recorded.
- Steve reminded everyone about the fortnightly meeting schedule alternating between technical and policy-focused sessions.

2. Review of GitHub Issues and Editorial Process:

- The editorial process involves raising GitHub issues, discussing them, reaching conclusions, and submitting pull requests for review.
- Nis has volunteered as an editor with maintained rights on the repository.

3. Verifier Experience and Trust Graph:

- Nis demonstrated a verifier experience showcasing the traversal and validation of a trust graph.
- Discussion on how to ensure the contextual validity of linked credentials and automating due diligence for various sectors.

4. Schema Context and Verifiable Documents:

- Discussion on the need to align schema context for digital product passports and verifiable credentials.
- Emphasis on pointing to existing interoperability profiles rather than reinventing them.

5. Vocabulary and Standards Mapping:

- Steve proposed creating a sustainability vocabulary to categorize ESG claims in digital product passports.
- Dr. Wang and Gregory highlighted existing work and offered contributions to the vocabulary design.

6. Versioning and Implementation Profiles:

- Discussion on how to handle versioning of specifications and implementation profiles.
- Proposal to group specifications into core and trust-related categories with implementation profiles reflecting different levels of conformity.

7. Extension Methodology for UNTP:

- The principle of defining a simple common core for UNTP and allowing industry-specific or geographic extensions.
- Need for a rule set to ensure non-breaking extensions.

8. Next Steps and Action Items:

- Participants to use GitHub tickets for further discussions and provide feedback.
- Steve to initiate discussions on specific issues and encourage the development of consensus on key points.

Action Items:

- Participants to review and comment on GitHub issues.
- Steve to publish a draft sustainability vocabulary.
- Nis to work on automated policy execution and verifier experiences.
- Follow-up discussions on extension methodologies and implementation profiles.

Closing Remarks:

- Agreement to use GitHub issues as discussion forums to reach consensus and develop content.
- Next meeting to focus on merging pull requests and further refining the specifications.

2024-01-11 Meeting Summary

Date: January 11, 2024

Participants:

- Steve
- Christian
- Peter
- Zach
- Kay
- Benjamin
- Nis
- Maria Teresa
- Kevin
- Brett
- Anil John
- Others

Agenda:

1. Welcome and Introduction
2. Review of Registration and Participation
3. Overview of GitHub Repository and Structure
4. Discussion on Key Sections and Specifications
5. Splitting into Technical and Policy Teams
6. Next Steps and Action Items

Key Points:

1. Welcome and Introduction:

- Participants greeted each other and wished a Happy New Year.
- The meeting was recorded for future reference.

2. Review of Registration and Participation:

- Steve reviewed the list of participants who had registered and noted the status of their registration.
- Participants were encouraged to complete their registration if not already done.

3. Overview of GitHub Repository and Structure:

- Steve shared the structure of the GitHub repository for the technical specifications of Recommendation 49.
- The repository includes sections on architecture, digital product passports, conformity credentials, traceability events, identifiers, vocabularies, verifiable credentials, data carriers, trust anchors, trust graphs, confidentiality, anti-counterfeiting, mass balance, ESG rules, GS1 usage, business cases, tools and support, extensions register, and implementation register.

4. Discussion on Key Sections and Specifications:

- Emphasis on the need to align digital product passports with existing standards, including those from the EU.
- Discussion on the importance of identifiers and the gap between current identifier systems and the needs of a digital trust architecture.
- The role of vocabularies in ensuring consistent categorization and reporting of ESG criteria.
- The significance of verifiable credentials and leveraging existing profiles from other initiatives.
- The need for clear governance and best practices for confidentiality and anti-counterfeiting.

5. Splitting into Technical and Policy Teams:

- Proposal to split the group into two teams: one focused on the technical specifications in the GitHub repository and the other on the policy recommendation document.
- Meetings will be held weekly, alternating between technical and policy discussions.

6. Next Steps and Action Items:

- Participants to review the GitHub repository and provide feedback via tickets.
- Steve to send out invitations for separate technical and policy meetings.
- Follow-up on registration for those who have not yet completed the process.

Action Items:

- Steve to set up a spreadsheet for tracking participant roles and contributions.
- Participants to raise issues and provide feedback on the GitHub repository.
- Schedule and conduct separate meetings for technical and policy teams.

Closing Remarks:

- Recognition of the interest and engagement from various stakeholders, including presentations to the OECD, GS1 Global Forum, and the European Commission.
- Encouragement for continued collaboration and contributions to ensure the success of Recommendation 49.

2023-12-14 Meeting Summary

Date: December 14, 2023

Participants:

- Steve
- Virginia Cram Martos
- Rakesh
- Franziska
- Mathieu
- Charles Arden-Clark
- Others

Agenda:

1. Introductions
2. Overview and Communication of Recommendation 49
3. Revised Document Structure
4. Call for Contributors and Next Steps

Key Points:

1. Introductions:

- New participants, including Virginia, Rakesh, Franziska, Mathieu, and Charles, introduced themselves and shared their backgrounds and expertise.

2. Overview and Communication:

- Steve shared a video explaining Recommendation 49 and its goals, emphasizing anti-greenwashing through supply chain transparency.
- Participants were encouraged to watch and share the video for better understanding and feedback.

3. Revised Document Structure:

- The document is divided into three sections: a high-level executive summary, detailed guidelines for implementation, and an annex for additional information.
- The executive summary will cover the introduction, scope, target audience, purpose and benefits, challenges, recommendations, and an opportunity for implementers to make a pledge.
- The guidelines section will detail business drivers, design principles, technical challenges, and the actual protocol, including costs, incentives, and implementation guidance.
- A GitHub repository has been created for detailed technical information and specifications to support the policy document.

4. Call for Contributors:

- Participants were invited to volunteer for writing different sections of the document.
- Emphasis on involving both business-oriented and technical experts to ensure the document is comprehensive and implementable.
- A spreadsheet will be set up to track potential stakeholders and contributors, distinguishing between observers and active contributors.

5. Next Steps:

- Spreadsheet to track participant roles and contributions will be created and shared.
- UNECE to confirm the revised structure of the document.
- Separate technical meetings to be scheduled after Christmas to focus on detailed content development for the GitHub repository.

Action Items:

- Steve to create and share a spreadsheet for tracking participants and their roles.
- UNECE to review and confirm the revised document structure.
- Participants to indicate their interest in contributing to specific sections.
- Technical meetings to be scheduled for post-Christmas to progress GitHub content.

Closing Remarks:

- Agreement to skip the meeting scheduled for December 28 due to the holiday season.
- Next group meeting to be held in a month, with parallel technical meetings starting after Christmas.

2023-11-30 Meeting Summary

Date: November 30, 2023

Participants:

- Steve
- Brett
- Kevin
- Benjamin
- Corey
- Felix
- Xinyang
- Nis
- Maria Teresa
- Stefano

Agenda:

1. Communication Strategies and Updates
2. Refactoring Recommendation 49 Document

Key Points:

1. Introduction and General Updates:

- Steve welcomed participants and highlighted the importance of communication.
- A project in Australia on agricultural traceability has successfully demonstrated the concepts in Recommendation 49, showing quick vendor adoption and implementation.

2. Communication Strategies:

- Emphasis on the importance of effectively communicating the project to various stakeholders.
- Discussion on creating sector-specific versions of the communication video (e.g., for critical raw materials, textiles).

- Participants encouraged to share the existing video and provide feedback.
- Maria Teresa agreed to post the video on official UN channels once updates are made.

3. Feedback on Communication:

- Participants agreed on the need for various media to reach different audiences.
- Suggestions included creating a range of materials from short soundbites to longer, detailed videos.
- Brett and others emphasized focusing on the flexibility and scalability of the protocol.

4. Refactoring Recommendation 49 Document:

- Discussion on aligning the structure of Recommendation 49 with previous UN recommendations.
- Agreement on including sections like scope, purpose, benefits, and a high-level summary.
- Inclusion of a cost-benefit analysis and discussion on inclusivity (small businesses, developing economies).
- Emphasis on providing a flexible yet implementable framework that can be adapted for different sectors.

5. Implementation Guidance:

- Importance of providing clear, implementable guidelines and schemas.
- Agreement on using projects like critical raw materials and agriculture as examples.
- Discussion on maintaining flexibility while ensuring interoperability and testability.

6. Next Steps:

- Steve to restructure the document based on the discussed framework.
- Participants to review and provide feedback on the restructured document.
- Plan to engage with policy makers for informal reviews before formal public review.

Action Items:

- Steve to complete the restructuring of the Recommendation 49 document within the next week.
- Participants to share the communication video and provide feedback.
- Maria Teresa to post the updated video on UN channels.
- Team to engage with policy makers for informal reviews of the draft document before the end of January.

Closing Remarks:

- Agreement on the next meeting to review the restructured document and continue content development.
- Maria Teresa emphasized the importance of involving policy makers early in the review process to ensure the document meets their needs and gains their support.

Adoption Group

! INFO

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Mailing List

A group mailing list is maintained and can be used by any list member to post messages to the group. The list also maintains an archive of all messages sent to the group.

- To [join the mailing list](#) - your request will be reviewed by a list administrator.

Meetings

Group meetings are held fortnightly. Please add the following links to your calendar.

UNTP Adoption team meetings are held fortnightly at alternating times to accomodate participants from different timezones. Use the links below to add the calendar entries to your diary or add the meeting links.

- **Thursday 9am UTC Meetings.** Every 4 weeks. Next meeting 10th July 2025.
 - [ICS Calendar File](#). Download and double click to add the meetings to your calendar
 - [Zoom meeting link](#). Click to join the meeting without a calendar entry.
- **Thursday 8pm UTC meetings.** Every 4 weeks. Next meeeting 24th July 2025.
 - [ICS Calendar File](#). Download and double click to add the meetings to your calendar.
 - [Join the meeting](#). Click to join the meeting without a calendar entry.

Each meeting will generally work through open [adoption group issues](#) and [pull requests](#).

Previous meeting dates, recordings, transcripts, and minutes are summarised below with the most recent meeting at the top.

Previous Meetings

Meeting	Summary	Recording	Transcription
2025-05-29	One sentance meeting summary here	video (insert link)	

Terms of Reference

Purpose & functions

The purpose of the Group is to coordinate UNTP aspects relating to the adoption of UNTP, under the direction of the UNTP Steering Committee.

- To maintain, subject to oversight from the Steering Committee, the communications templates, enablement and case studies to facilitate adoption of UNTP by both public and private sector organizations.
- To develop and maintain the [Business Case section](#) of UNTP web site
- To maintain the [implementation register](#)
- To maintain the [extensions register](#)
- To develop and maintain the Community Activation Program
- To develop and maintain the Value Assessment Framework
- To develop and maintain the relationships with global DPP initiatives (EU JTC24, ISO, ITU, IEEE, UNECE, ??)
- To develop and maintain a list of communications templates for extenders and implementers
- To develop and maintain UNTP training programs
- To develop and maintain UNTP communications
- To liaise with other UNTP sub-committees to be aware and to advise on any adoption related issues that may arise.
- To provide adoption advice, as required, to Industry Extension Groups
- To liaise with UN/CEFACT to ensure continuing compatibility with applicable CEFACT standards, including interactions with other global DPP efforts
- To develop and maintain the relationships with global DPP standards initiatives
- To maintain awareness of developments within global DPP standards efforts to facilitate alignment with international practices
- To liaise with other UNTP sub-committees to ensure that compatibility between UNTP elements is maintained.
- To maintain the Group mailing list

Roles

Group Lead

- Arrange and Chair Group meetings
- Provide updates as required to the UNTP Steering Committee
- Attend UNTP Steering Committee meetings
- Act as liaison point for identified global DPP initiatives

- Provide recommendations to the Steering Committee on matters having potential to affect other UNTP sub-committee activities
- To cooperate with the Steering Committee in handling complaints and disputes relating to extenders and implementers
- To provide advice and to participate when appropriate in Suspension proceedings and Appeal proceedings relating to extenders and implementers
- Maintain mailing list specific to Sub-committee participation
- Delegate duties to other Group members as applicable

Group Technical Editor

- Maintain relevant Github repository pages
- Maintain Pull Requests relating to the Business Case section of UNTP website
- Maintain extension and implementation registers

Operation

- The Group is open to anyone to participate as an observer.
- Contributors to specifications and content maintained by the group must be registered UN/CEFACT experts.
- The Group will meet monthly, or more frequently.
- Where deemed necessary by the Group Lead, working groups may be established for dealing with specialized matters
- While consensus among group participants is always desirable, decisions affecting the UNTP Adoption Working Group are taken by the Group Lead and are subject to oversight by the Steering Committee.

2025-05-29 Meeting Summary

Paste AI generated meeting summary here.

Supply Chain Group

!(INFO)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Terms of Reference

Insert terms of reference here

Mailing List

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- To [join the mailing list](#) - your request will be reviewed by a list administrator.

Meetings

Group meetings are held fortnightly. Please add the following links to your calendar.

Next meeting 12th June 2025.

- ICS Calendar File ([insert ics file here](#)) Download and double click to add the meetings to your calendar
- Web meeting link ([insert zoom/meet/teams link here](#)). Click to join the meeting without a calendar entry.

Each meeting will generally work through open [issues](#) and [pull requests](#).

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Previous Meetings

Meeting	Summary	Recording	Transcription
2025-05-29	One sentence meeting summary here	video (insert link)	transcript

2025-05-29 Meeting Summary

Paste AI generated meeting summary here.

Conformity Group

!(INFO)

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Previous Meetings

Meeting	Summary	Recording	Transcription
2025-05-29	One sentence meeting summary here	video (insert link)	transcript

Terms of Reference

Abbreviations used

- DCC - Digital Conformity Credential
- SVC - Sustainability Vocabulary Catalogue

Purpose & functions

The purpose of the Group is to coordinate UNTP aspects relating to conformity credentials, under the direction of the UNTP Steering Committee. Specific functions are as follows:

- To maintain, subject to oversight from the Steering Committee, the UNTP Core DCC specification, including definitions and vocabulary
- To develop and maintain the SVC specification, including Conformity Topic Classification and the Conformity Vocabulary Schema.
- To maintain the UNTP Certifier Implementation Register
- To maintain the UNTP Conformity Scheme Register
- To maintain the DCC Test harness
- To provide advice to the UNTP Adoption subcommittee regarding conformity-related issues arising in relation to UNTP adoption
- To provide technical advice, as required, to Industry Extension Groups
- To liaise with UN/CEFACT to ensure continuing compatibility with applicable CEFACt standards, including the Digital Product Conformity Certificate Exchange standard.
- To maintain awareness of developments within ISO CASCO and other relevant global conformity assessment institutions to facilitate alignment with international practices
- To liaise with other UNTP sub-committees to ensure that compatibility between UNTP elements is maintained.
- To maintain the Group mailing list

Roles & Responsibilities

Group Lead

- Arrange and Chair Group meetings
- Provide updates as required to the UNTP Steering Committee
- Attend UNTP Steering Committee meetings
- Act as liaison point for identified global conformity assessment institutions
- Provide recommendations to the Steering Committee on matters having potential to affect other UNTP sub-committee activities
- To cooperate with the Steering Committee in handling complaints and disputes relating to the DCC or SVC
- To provide advice and to participate when appropriate in Suspension proceedings and Appeal proceedings relating to DCC or SVC
- Maintain mailing list specific to Sub-committee participation
- Delegate duties to other Group members as applicable

Group Technical Editor

- Maintain relevant Github repository pages
- Maintain Pull Requests relating to the DCC and SVC specifications
- Maintain classification lists, implementation registers
- Maintain DCC Test Harness

Operation

- The Group is open to anyone to participate as an observer.
- Contributors to specifications and content maintained by the group must be registered UN/CEFACT experts.
- The Group will meet monthly, or more frequently.
- Where deemed necessary by the Group Lead, working groups may be established for dealing with specialized matters
- While consensus among group participants is always desirable, decisions affecting the UNTP Core DCC Specification are taken by the Group Lead and are subject to oversight by the Steering Committee.

2025-05-29 Meeting Summary

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Technical Group

!(INFO)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Terms of Reference

Insert terms of reference here

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2025-05-29	One sentence meeting summary here	video (insert link)	transcript

2025-05-29 Meeting Summary

Paste AI generated meeting summary here.

Using Github

!(INFO)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

All contributions to this project are done as GitHub [Pull Requests](#). This means that you make your changes in a separate branch and then request for your changes to be "merged" via an approval workflow.

To be able to make propose the changes you need to:

1. Signed in to GitHub. You can sign up [here](#) if you haven't done it yet.
2. Create a fork of the spec-untp repo. Go to <https://github.com/uncefact/spec-untp/fork> and click on [Create fork](#) green button.

Markdown

All content on the UNTP website is written [using the Markdown notation](#), a very simple text based editor. If unfamiliar with markdown, we suggest you experiment with it on a [markdown playground](#) so that you understand how to create headings, bulleted lists, tables, and so on.

Simple Changes

If you only need to make some very simple changes to an existing page (eg fix some typos or modify some content) then the simplest solution is just to use the online editor. On the bottom left of any [UNTP website](#) page there is an [Edit this page](#) link.

1. Click on the [Edit this page](#) link - you'll be presented with an editable version of the page in Markdown. Note that you can toggle between [Edit](#) and [Preview](#) tabs so that you can see how your Markdown will look. Complete all your changes to the page.
2. Click on the [Commit changes...](#) green button on the top right of the page. You'll get a pop-up with a commit message. Type a description of your changes (eg "fixed some typos"). Then click on the [Signoff and propose changes](#) green button. And on the next page you can edit your commit message if you wish - then click the [Create pull request](#) green button.
3. That's it, you're done. The pull request will be verified (no broken links etc) and then queued for approval and release.

More Complex Changes.

If you are going to be a regular contributor and/or you want to propose more significant multi-page changes in one request, then you should set yourself up with a local copy of the website where you can make as many changes as you like and test them before creating a pull request for the main repository.

1. If you don't already have a GitHub Desktop client installed then get one from the [GitHub download site](#). Sign into GitHub through your desktop ([GitHub Desktop](#) -> [Settings](#) -> [Accounts](#)). This will ensure that you can see all the GitHub repositories that you also have access to online.
2. Clone your UNTP repository fork using the [File->Clone Repository...](#) button top left of your GitHub Desktop client and typing `spec-untp` in the filter input field. Make sure you choose the fork, it will be under [Your repositories](#) named `yourusername/spec-untp`. You'll need to choose a local folder to put your UNTP repository clone. We suggest you use a proposed [GitHub](#) folder and keep all cloned repositories in it. Click on [Clone](#) button, the GitHub Desktop client will clone the fork (download files to your computer) and ask you about how you are planning to use this fork. Choose [To contribute to the parent project](#) option.

Checkout GitHub Desktop [Forking a repository](#) help page for step-by-step instructions.

3. Once you've cloned the UNTP repository you can see the files in the Finder/Explorer by clicking the [Show in Finder/Show in Explorer](#) button. Now we advise you to create your own branch in which to make changes, this will make proposing the changes easier. To make a local branch using your GitHub Desktop, make sure your current repository is spec-untp the then click on current branch and select new branch. Give it any name like `untp-spec-changes` and create the branch as a copy of main. Click on [Publish branch](#) button.
4. Now when the branch is created, you can find the files that you need to change by clicking the [Show in Finder/Show in Explorer](#) button and navigating from `spec-untp` folder to `website` and to `docs`. There you'll see a list of folders that correspond to the UNTP site structure (about, specification, etc). Inside each folder is an `index.md` file - that's the content that appears at the heading level (eg [Business Case](#)). Inside that folder you'll see the files that represent the pages under that heading. Any files with a `.md` suffix are the Markdown files that hold the text for that page. Any other files such as `.png` files contain images that are referenced from that page.
5. Make the changes you need to make to the files using any editor you like, [Sublime Text](#) is not a bad option. At this point we **strongly recommend** that you have a local copy of the website running on your laptop - follow the instructions for [setting up the local website](#) below. Whenever you save a change to a `.md` file you should immediately see that change reflected on your local UNTP website copy. This is a good way to test that your changes look right and there aren't broken links.
6. Make sure you saved all the files after editing them in the editor, otherwise the changes won't show up in the GitHub Desktop Client. Review the changes, provide the summary for the commit and click on [Commit to](#) button to create the commit just like you did for the online [simple changes](#) edit. That will create a versioned change on your local GitHub. You can create multiple commits doing the changes gradually.

Checkout GitHub Desktop [Write a commit message and push your changes](#) help page for step-by-step instructions. If you have a large amount of change to many un-related pages then we suggest that you create a separate branch for each.

7. When you have no more local changes - all changes where committed, you will see [Push origin](#) button. Click it to push your local commits to GitHub.
8. Now click on [Preview Pull Requests](#) to preview all changes from every commit created on the branch. If you are happy with the result click on [Create pull request](#) on your desktop. That will trigger the creation of a pull request on the

"origin" GitHub repository where UNTP is maintained. You'll be redirected to the UNTP GitHub site online and will see the same pull request screen that you saw with the [simple process](#) described above.

Checkout GitHub Desktop [Creating a pull request](#) help page for step-by-step instructions.

9. You're done - your changes will be verified and queued for approval.

Running a local UNTP website

The UNTP website is built using [Docusaurus 2](#), a modern static website generator.

Note: You can copy code snippets below and paste them to your terminal

To run it locally:

1. if you don't already have node.js and NPM installed then install them using the [Node Installer](#) - select the "prebuilt installer" and chose the right options for your mac or pc.
2. Open your command line / terminal window. On Mac you'll find it in [Applications](#) -> [Utilities](#) -> [Terminal](#).
3. Find the GitHub folder that has the cloned UNTP repository you created as described in the [complex changes](#) section.
Hint `ls` command will list the files in the current folder and `cd someFolder` will move you to that folder. `cd ..` will move you back up a folder level. Use `ls` and `cd` till you are in the [website](#) folder of the UNTP repository.

```
cd ~/GitHub/spec-untp/website/
```

4. If you don't already have Yarn installed then type `npm install --global yarn`. Yarn is a dependency manager that will keep all your local bits and pieces of website software up to date.

```
npm install --global yarn
```

5. Type `yarn install --frozen-lockfile` to install the dependencies needed for the website (which includes docusaurus).

```
yarn install --frozen-lockfile
```

6. Type `yarn start`. This will launch the website and open it in a browser windo on your local machine at <http://localhost:3000/spec-untp/>. Whenever you make changes to UNTP Markdown files, you'll see the change on your local website.

```
yarn start
```

7. To stop the website, enter "Ctrl+C" in the terminal window. You can start it again anytime by navigating to the [website](#) folder as described above and typing `yarn start`. You don't need to re-install node or yarn or docusaurus.

Business Case

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The Business Case for UNTP implementation

In this section we provide a broad analysis of the key drivers, impacts, costs, and benefits associated with the implementation of the United Nations Transparency Protocol (UNTP) in an overall digital trade facilitation program.

- [Stakeholder motivations](#) summarizes the full range of stakeholder types and their motivations.
- [Business case for industry](#) details the business value propositions and costs for UNTP implementation by industry at individual company level and provide a simple business case template.
- [Business case for government](#) details the business case for governments at both individual agency and national economy levels.
- [Community activation program](#) defines a methodology and business case for industry member associations to engage their membership for collective implementation at the community level.
- [Value assessment framework](#) is essentially the UNTP business case for UNECE because it defines the UNTP KPIs that will be measures so that global impact can be tracked.

Stakeholder Motivations

The table below provides an overview of the different stakeholders participating in the trade ecosystem, including their role and, key motivating factors and link to the UNTP benefit statement in the [Audience, Benefits & Goals](#) section.

Stakeholder	Motivation
Consumers/Consumer Groups - Purchase and use products.	<i>We want to make informed choices about the products we buy, but it's hard to find reliable information about their origins and manufacturing.</i>
Regulators - Enforce compliance with laws and regulations.	<i>We struggle to ensure that all companies comply with safety and environmental regulations because we lack visibility into their supply chains.</i>
Producers and Manufacturers - produce raw materials	<i>We face difficulties proving the ethical sourcing and quality of</i>

Stakeholder	Motivation
and manufacture goods.	<i>our raw materials to our customers.</i>
Brands and Retailers - Market and sell products to consumers	<i>Our customers want to know where our products come from and how they are made, but it's hard to provide that information.</i>
Recyclers and Refurbishers - Manage end-of-life products.	<i>We often don't have enough information about the materials we receive, making recycling and refurbishment less efficient.</i>
Industry Member Associations - Represent and advocate for industry interests	<i>Our members need support in adapting to new regulations and industry practices, but it's challenging to provide consistent guidance.</i>
Environment and Human Welfare Organisations - Advocate for environmental protection and human rights.	<i>It's difficult to hold companies accountable for their environmental and human rights practices without clear information.</i>
Standards Organisations - Develop and maintain industry standards.	<i>It's challenging to keep our standards relevant and ensure they are adopted consistently across the industry.</i>
Accreditation Bodies and Certifiers - Provide certification and accreditation services	<i>We need a reliable way to verify that companies are truly adhering to industry standards and ethical practices.</i>
Transport and Logistics Providers - Manage the movement of goods.	<i>We need to track shipments accurately and ensure timely deliveries, but our current systems lack the necessary transparency.</i>
Financial Institutions - Provide financial services and investments.	<i>We need to assess the risks associated with our investments, but it's hard to get clear information about companies' supply chains.</i>
Software Developers - Develop software solutions to support transparency.	<i>We want to create solutions that meet market needs, but it's hard to anticipate what businesses require for supply chain transparency.</i>
Consultants & Advisors - Offer various advice services to businesses.	<i>Our clients need help complying with new transparency regulations, but it's difficult to offer the right services without clear guidelines.</i>

Business Case for Industry.

In today's global marketplace, commercial incentives drive business action. With regard to sustainable business practices and products, there is a maturity trend in the way businesses think about value.

- **Historically** sustainability was a marketing exercise that focused primarily on green labeling to promote sales. This led to an explosion in green-washing and precipitated a [race to the bottom](#) of devalued incentives.
- **Currently** the green-washing explosion has led to a similar dramatic increase in company-level and product-level disclosure regulations to counter green-washing and to support national net-zero promises. For most businesses today, sustainability has moved from a marketing concern to a risk and compliance concern. UNTP has much to offer in support of organizational compliance and due-diligence obligations.
- **In future** more and more organisations are likely to follow today's [leading organisations](#) in placing sustainability at the front and center of their business strategy, profitability, and brand value. UNTP can offer the value chain transparency at scale so that brands can be confident in the implementation of sustainability strategies.

At a high level adopting UNTP offers several key benefits:

- **Supply Chain Optimization** : Detailed supplier data allows for informed selection of more sustainable and resilient supply options.
- **Enhanced Disclosure Accuracy** : Access to granular, product-level sustainability data enables precise reporting and provides the key information needed for organisations to select supply so that their year-on-year sustainability disclosures demonstrate a clear improving trend.
- **Reputational Risk Management** : Transparency in the supply chain helps mitigate risks associated with unsustainable supplier practices.
- **Financial Advantages** : The financial sector increasingly rewards strong sustainability credentials with improved terms for trade finance and investment capital.

For more information and templates, please visit the [Business Case for Industry](#). page.

Business Case for Government.

The implementation of the UN Transparency Protocol (UNTP) is expected to yield significant economic benefits for participating nations. While the precise impact may vary based on a country's existing trade infrastructure, regulatory environment, and level of digitalization, there are several opportunities for improvement.

- **Trade cost reduction** : Implementation of the UNTP is projected to reduce trade costs through the standardisation and digitization of processes. This includes streamlining customs clearance, documentation, inspections, and other administrative procedures.
- **Enhanced Revenue Collection** : Improved compliance and reduced fraud, facilitated by the UNTP's transparency measures, may lead to more effective revenue collection from customs duties and taxes.
- **Facilitate Trade Policy Development** : Receiving granular data and attributes of what gets in and out of the country and being able to aggregate that data can help policy makers in shaping policy in a more targeted way to enhance their countries competitiveness.
- **Foreign Direct Investment (FDI)** : Nations adopting the UNTP may become more attractive to foreign investors due to increased efficiency and predictability in trade processes.

- **Supply Chain Resilience and Competitiveness** : The real-time data and transparency provided by the UNTP can enhance the resilience of supply chains to disruptions and improve overall competitiveness in the global market.

The realisation of these benefits may depend on several factors, including:

- The nation's initial conditions and existing trade barriers
- The extent and effectiveness of UNTP implementation
- Complementary reforms in areas such as infrastructure, governance, and technology

The UNTP is supported by UNECE policy [Recommendation 49 - traceability and transparency at scale](#) that defines specific recommendations for member states that wish to reap the economic benefits of increased supply chain traceability, transparency, and trust.

For more information and templates, please visit the [Business Case for Government](#). page.

Community Activation Program.

Supply chain actors are often reluctant to proceed with a specific initiative like UNTP unless they have some confidence that others in their industry are doing the same. There are not only obvious interoperability benefits from industry wide adoption but also cost benefits. For example, it is often the case that a small number of commercial software platforms are commonly used by larger numbers of businesses in a given industry and jurisdiction. So a software vendor that implements UNTP once will benefit all its customers. Additionally there are often a few standards and a few certifiers that are common to an industry and country. Finally, when a large community is willing to act together, there will often be financial incentives from governments and/or development banks that can assist with initial funding. In short, there are many reasons to approach UNTP implementation at a community level.

The Community Activation Program (CAP) is a methodology and business case for a community level adoption of UNTP including a tool for financial cost/benefit modelling at community level. The CAP is an ideal vehicle for existing [industry member associations](#) to bring new value to their members by supporting their connections into global sustainable value chains.

For more information, please visit the [Community Activation Program](#) page.

Value Assessment Framework.

Once a community or individual implements UNTP and transparency data starts to flow at scale, it will become important to continuously assess the actual value that is realised. Dashboards and scorecards that measure key performance indicators will energise ongoing action and provide valuable feedback at both community and UN level. Therefore the UNTP defines a minimal set of KPIs that each implementer can easily measure and report to their community - and which communities can report to the UN so that global impact can be measured and mapped to the 169 specific targets defined by the [17 UN Sustainable Development Goals](#).

For more information, please visit the [Value Assessment Framework](#) page.

Business Case for Industry

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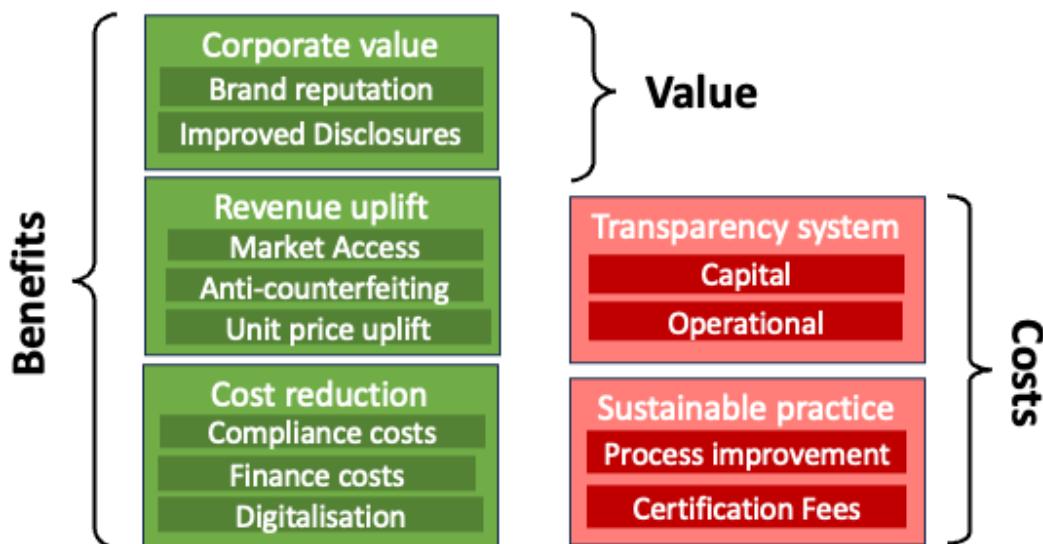
The decision to implement UNTP needs a positive business case to justify the investment. The purpose of this page is to provide a framework for business case development. We provide a generalized cost / benefit model and then discuss its application to specific roles and industries. We also provide a separate cost benefit model and business case template for regulators.

Note: The economic impacts described in this document are projections based on available data and economic models. Actual results may vary. Regular monitoring and evaluation of the UNTP's effects are recommended to assess its efficacy and guide any necessary adjustments to the protocol.

Industry Cost Benefit Model

The high level model shown below breaks benefits into three categories and costs into two categories.

- Benefits accrue through increasing revenue and/or decreasing cost. Improved margins that result from that of course contribute to corporate value but there are also less tangible benefits at the corporate level such as brand reputation.
- Costs are incurred through changes to production processes to achieve greater sustainability and the implementation of traceability & transparency systems to communicate that verifiable sustainability.



Actual benchmarks for benefits and costs by industry sector and geographic region will become increasingly available over time through the UNTP Value Assessment Framework (VAF). At this point in time, benefits and costs are described qualitatively and supported with metrics from public research.

Benefits - Revenue Uplift

Market Access

Legislation increasingly requires companies to prove ESG credentials to be able to trade in certain countries. Examples include the EU Deforestation Regulation [EUDR](#) as well as several due-diligence regulations such as the [EU CSDDD](#) and [US UFLPA](#). Legislation effectively put pressure on buyers to prove provenance and sustainability requirements for certain products, as well as a higher burden of proof from suppliers from certain regions. In many cases, these regulations reverse the burden of proof - namely that companies must prove that they are compliant in order to maintain market access. UNTP based transparency allows companies to keep trading in said areas, rewarding suppliers ensuring good practices rather than being forced outright out of these markets.

- *Quantification.* The percentage of revenue that is either retained or increased will depend on the commodity and footprint of any given supplier in a regulated market. The value of imported goods impacted by EUDR is approximately \$400Bn which is around 1.2% of world trade. The volume of trade impacted by Due Diligence acts is similar or larger than EUDR.
- *References.* [EU market import volumes](#), [Krungsri EUDR impact analysis](#),

The impact of these trade barriers for any given company will be between 0% and 100% of revenue depending on which commodities they sell to which market. But given the collective impact of between 2% and 3% of world trade, an average benchmark of 1% of revenue seems conservative.

Unit Price Uplift

Consumers are increasingly selective about product choice based on believable sustainability criteria. There are several surveys that indicate around two-thirds of consumers consider sustainability in product choices and that around one third are willing to pay a premium. The amount of the price premium varies widely and there is evidence that consumer behaviour change is slow and sometimes only temporary. There is also evidence that rich data (for example UNTP DPPs) drives stronger behaviour. The amount of end product price increase that flows through to the upstream supply chain is more difficult to quantify but may be very limited. Nevertheless, if buyers select supply based on sustainability criteria then non-conforming suppliers and products are likely to be forced into lower-priced commodity markets. Buyers tend to be reacting more quickly than suppliers to these demands, as a result, moving forward it is likely that there will be a shortage of suppliers able to deliver products with satisfying ESG credentials. Buyers who are able to sign long term contracts today and develop partnerships with aligned suppliers will have a considerable price advantage compared to market laggards.

- *Quantification* Estimates of the average sustainability premium that consumers will pay vary widely from around 1% to 12%. If 30% of consumers are willing to pay a 5% premium then the overall unit price impact is around 1.5%.
- *References.* [Consumer high estimates](#), [Consumer low estimates](#).

The unit price uplift for verifiable sustainable goods will vary widely depending on commodity and market. However an average benchmark of 1% seems reasonable and conservative.

Anti-Counterfeiting

Global trade in counterfeit goods is estimated at between 2% and 5% of trade. The most impacted commodities are pharmaceuticals and luxury goods including quality wines & spirits. The volumes increase when pirated / smuggled goods are taken into account including illicit tobacco into high tax markets. What is more difficult to quantify is the proportion of counterfeit goods that are un-knowingly purchased as genuine goods since, in many cases, buyers of fake luxury goods or illicit tobacco make purchases knowing that the goods are fake or pirated. UNTP offers a simple but effective anti-counterfeit protocol that works well when buyers are motivated to confirm that goods are genuine.

- *Quantification.* 4% of global trade represents about \$1.2Tn in counterfeit goods. If approximately 50% of that trade can be impacted by improved anti-counterfeiting measures then the average value is around 2%. If the effectiveness of anti-counterfeiting measures is estimated at 50% then the value falls to around 1% of trade.
- *References.* [OECD trends in counterfeit goods](#), [USTPO counterfeit estimates](#).

The value of sales recovered by reductions in illicit goods will vary from 0% for commodity goods to as much as 10% for pharmaceuticals and some luxury goods. A benchmark value of 1% industry-wide seems reasonable and conservative.

Benefits - Cost Reduction

Compliance Costs

Regulatory compliance costs encompass the administrative burden of reporting, processing fees, tariffs, border clearance delays, and penalties. As sustainability regulations increase, these will be more rigorously enforced at borders, likely resulting in higher compliance costs. The UNTP offers customs authorities and corporate regulators higher confidence data, which can streamline border processing, reduce administrative costs, and minimize delays. As countries advance towards net zero commitments and implement domestic carbon pricing, it is increasingly likely that more countries will impose carbon border tariffs, such as the planned [EU Carbon Border Adjustment Mechanism \(CBAM\)](#). High-quality evidence of a low carbon footprint via UNTP Digital Product Passports (DPPs), along with full traceability, can help importers prove compliance with the EU rules of emission estimation, and reduce the burden of data collection and management for tariff treatment. Additionally, high-quality evidence of conformance of imported goods reduces the risk of punitive non-compliance fines. Importers with traceable, high-quality data can ensure that they are only paying CBAM charges on actual emissions. Without accurate data, importers might overestimate emissions, leading to higher costs. Detailed tracking allows them to minimize over-payment and reduce their carbon liabilities if the carbon price effectively paid in the export country can be deducted.

- *Quantification.* The compliance cost under CBAM, a steel producer with a high emission profile, might face a carbon levy in the range of €50–€90 per ton of CO₂ emitted, depending on current EU ETS carbon prices. High-quality evidence of carbon price paid in the export country can substantially adjust that value.
- *References.* [EU Carbon Border Adjustment Mechanism](#), [Wood MacKenzie CBAM Analysis](#)

Finance Costs

UNTP provides a framework based on international standards which can accommodate different ESG risks, enabling development banks to standardize their reporting and ensuring their mandate, without having to create ad-hoc structures for each Sustainable Supply Chain Finance Deal. This unlocks a significant trade finance gap, and enables preferential finance to

reach deep-tier suppliers. Access to lower financing costs for suppliers results in lower cost of goods sold and improved margins. These trade finance arrangements often come with grants that can support costs associated with the ESG transition, such as support certification, consulting or implementation of new ERP systems for reporting.

Access to Trade Finance

The Asian Development Bank (ADB) estimates that the global trade finance gap was approximately \$2.5 trillion in 2022, up from \$1.5 trillions in 2016 with a significant portion attributable to SMEs applicants, lack of visibility, and issues with country risk, credit-worthiness and lack of sufficient information by the applicant. At the same time, Supply Chain Finance (SCF) has grown from \$330 billion in 2015 to \$1.8 trillion in 2021, despite this growth, SCF has not yet had a major impact in reducing the trade finance gap due to difficulty reaching past tier 1 suppliers. By adopting the UNTP, this gap can be reduced by enabling more companies to access preferential financing thanks to increased visibility over ESG credentials and ability to provide identity assurance from a trusted register, combined with SCF reverse factoring operating models which reduce applicants risk by tying the financing to the buyer credit risk.

- References Asian Development Bank (ADB), [Trade Finance Gaps Growth and Jobs Survey 2021](#), [Trade finance gaps growth jobs survey 2023](#). [Deep-Tier Supply Chain Finance 2022](#)

Reduced Finance Costs

According to the International Finance Corporation (IFC), companies that adopt sustainable practices can reduce their financing costs by up to 20% due to lower risk premiums and better access to capital.

- References International Finance Corporation (IFC), "Sustainable Finance: Creating Value for Companies and Investors," 2020.

Improved margins

A study by the Global Reporting Initiative (GRI) found that companies with strong ESG performance can achieve up to a 10% improvement in profit margins due to enhanced operational efficiencies and lower financing costs.

- References Global Reporting Initiative (GRI), "The Business Case for ESG: How Sustainability Can Drive Financial Performance," 2019.

Cost of Goods Sold

A report by McKinsey & Company indicates that companies with optimized supply chain financing can reduce their cost of goods sold by 5% to 10% due to lower financing costs and improved supply chain efficiencies.

- References [McKinsey & Company, Unlocking success in digital transformations, 2018](#)

Digitalisation Efficiency

Digitalisation through UNTP enables automated data collection and processing, reducing manual labor and errors. This leads to streamlined operations and faster decision-making. Enhanced digitalisation provides real-time visibility into supply chain activities, allowing for better inventory management and demand forecasting. Access to accurate and timely data enables

companies to make informed decisions, improving overall business performance. Finally, digitalisation allows for better tracking of product quality and delivery times, leading to improved customer satisfaction and loyalty.

Digitalisation as a whole of organisation initiative can deliver a 10% to 20% reduction in operational costs due to automation and improved data accuracy. Improved supply chain visibility can reduce inventory holding costs by 15% to 30% and decrease stock-outs by 20%. Data-driven decision-making can increase productivity by 5% to 10% and enhance profitability by 3% to 5%. Enhanced customer satisfaction can lead to a 10% increase in repeat business and a 5% boost in overall sales.

- *Quantification* The digitalisation cost savings are for enterprise wide digital transformation. A smaller but significant proportion of those savings could be allocated to digitalisation of supply chain traceability & transparency through UNTP implementation. A 1% reduction in operating costs is a conservative estimate.
- *References* [McKinsey & Company reports on digital transformation](#), Deloitte insights on operational efficiency. Gartner reports on supply chain visibility, Accenture studies on inventory management. Harvard Business Review articles on data analytics, PwC reports on data-driven strategies. Forrester Research on customer experience, Bain & Company studies on customer loyalty.

Benefits - Corporate Value

Brand Reputation

Transparency in supply chains builds consumer trust, as customers are increasingly concerned about the ethical and environmental impact of their purchases. Companies that can demonstrate their commitment to sustainability and ethical practices are more likely to gain consumer loyalty. Companies with strong ESG credentials often see an increase in brand value. This is because consumers, investors, and other stakeholders perceive these companies as more responsible and forward-thinking. Companies that adopt the UNTP can differentiate themselves from competitors by showcasing their commitment to transparency and sustainability. This can lead to a stronger market position and increased market share. Finally, transparent supply chains help companies identify and mitigate risks related to unethical practices, environmental violations, and other ESG issues. This proactive approach can prevent reputational damage and associated financial losses.

Studies reveal that over 50% of global consumers and over 75% of millennials are willing to pay more for sustainable brands. Also that over 80% of consumers will purchase a product because a company advocated for an issue they cared about, and over 70% will refuse to purchase if they find out a company supports an issue contrary to their beliefs. Brands with high ESG scores have been found to achieve a brand value premium of up to 10%. Brands with strong reputations recover more quickly from crises, with a 5% to 10% faster recovery in stock prices.

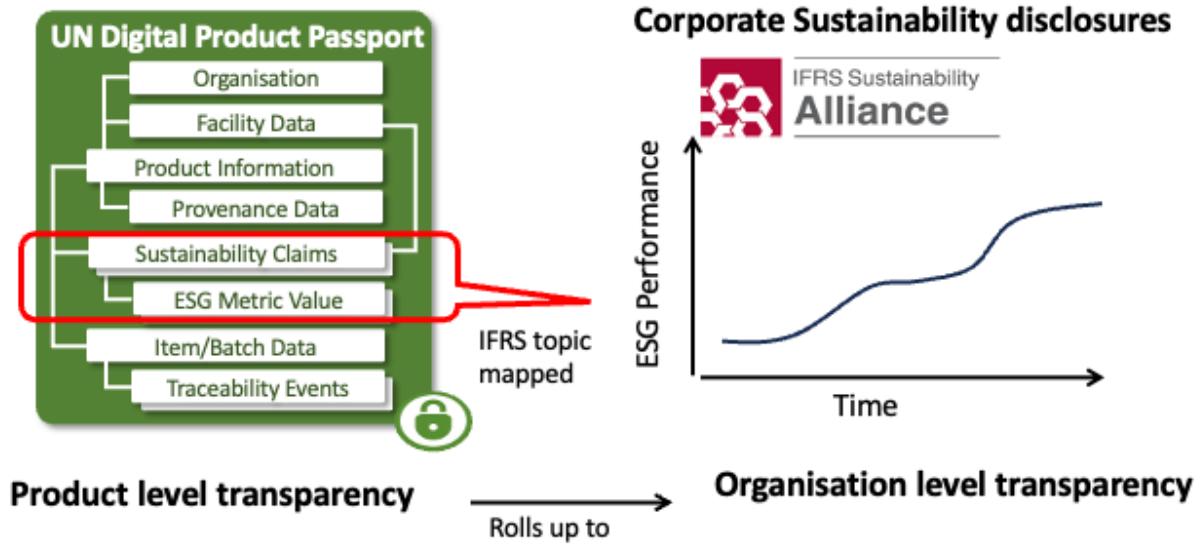
- *Quantification.* The brand value benefits listed above will accrue for companies that place sustainability at the center of their corporate strategy and implement a range of measures. UNTP implementation is only one measure but will add considerable trust to sustainability claims and can therefore conservatively account for a 1% increase in brand value.
- *References.* Nielsen, "The Sustainability Imperative: New Insights on Consumer Expectations," 2015, [Brand Finance](#), "Global 500 2020: The Annual Report on the World's Most Valuable Brands," 2019. RepTrak, "Global RepTrak 100: The World's Most Reputable Companies," 2019. Cone Communications, "2017 Cone Communications CSR Study," 2017.

Improved Disclosures

Regulations that mandate annual corporate sustainability disclosures are being drafted or already in force in most economies. They generally require reporting of concrete metrics such as CO₂ equivalent emissions and almost all include scope 3 emissions (ie emissions associated with upstream supply). The World Business Council for Sustainable Development (WBCSD) defines a generic model for emissions reporting and highlights the fact that, for most companies, scope 3 emissions represent around 70% to 80% of their emissions footprint.

We have included a separate category for corporate disclosures because there is a serious problem facing most corporates today. The problem is that most corporates simply do not have the data from their upstream suppliers to directly measure their scope 3 emissions footprint. Therefore the only viable option is indirect measures such as using industry average intensity for each input product or material. Without direct information from suppliers there is no mechanism to select lower intensity supplies - and, correspondingly, there is no incentive for suppliers to reduce their emissions. Corporates that increase sales volume year on year are therefore likely to also report increased emissions (increased volume multiplied by an unchanged industry average). Companies that show deteriorating emissions performance are likely to be punished through reduced consumer loyalty, reduced brand value, increased border tariffs, and reduced access to finance.

Direct measures of supplier sustainability performance through UNTP digital product passports will provide corporates with the means to select more sustainable supply and therefore directly improve their own aggregate performance year on year.



- *Quantification.* The same metrics as apply to brand reputation apply here.
- *References.* [WBCSD Pathfinder 2.0 Framework](#)

Costs - Sustainable Practices

Process Improvement

Suppliers are often requested to bring ESG improvements based on the materiality matrix of their buyers, so as to align with the buyers ESG strategic priorities: Examples may include: Reducing carbon emissions of particular energy intensive processes (i.e. by adopting less energy intensive processes or switching to renewable energy sources) Reducing or eliminating the use of harmful chemicals in heavy industrial processes Improving human or labour rights issues within their supply chains These

improvements are often costly, which are often absorbed by loans. Green finance mechanism can help reduce the financing cost of these improvements, and are often related to these improvements, while the establishment of long term contracts with buyers can on the one hand secure cash flow for suppliers to absorb those costs over the years, while on the other guarantee to the buyer the flow of conform goods.

- *Quantification.*
- *References.*

Audits & Certification

Suppliers that improve their processes towards sustainability practices have three ways to prove their credentials to their buyers, namely carrying out a self assessment, being audited by the buyers and being audited and certified by a third party, the latter of which carries the greatest weigh in terms of credibility, both for voluntary improvements and certainly for regulated ones. These certifications and audits often need to be made for each ESG risk where mitigating actions have occurred, with certifications starting in the 5 figures for each certification type.

- *Quantification.*
- *References.*

Costs - Transparency System

Establishing a transparency systems along a supply chain carries its own costs in the form of consulting fees to map and study the structure and processes and actors involved in a specific supply chain, the data elements of it and how those conform to an interoperability protocol such as UNTP as well as software and IT integration and adaptation costs, all of which is expected to range in the six figures. It also carries costs to run such a system on a day to day basis. At the same time, UNTP's principle is to use what is already available and being used, or planned to be used, by participants, rather than buying new software; once implemented we expect the operational costs to be in a similar range to what existed before hand, with any additional cost related to additional features related to benefits which the industry might require.

Capital investment

In order to adapt a digital ecosystem to an interoperability protocol such as UNTP, adopters will likely rely on consulting companies to assess the supply chain, identify data elements, and evaluate compatibility with UNTP standards and may decide to rely on consultants also to project manage and implement the project. Equally buyers will need to integrate their systems with their suppliers systems, or decide to commonly use a system that conforms to UNTP.

- *Quantification.*
- *References.*

Operational costs

As a UNTP complaint system set up is designed to work with what is already available, we expect adopters to get back more for the same resources they were already using for transparency purposes AUTOMATION, COST SAVINGS.. At the same time,

the wealth of information resulting from full traceability will likely drive adopters to capitalise on their investment and add resources to analyse and disclose their supply chain data where they see a return.

- *Quantification.*
- *References.*

Industry Business Case Template

Business Case for Government

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Regulator Cost Benefit Model

TBD - insert model diagram here

Benefits - National Economy

Benefits - Compliance Outcomes

Benefits - Government Efficiency

Costs - Implementation

Costs - Operational

Regulator Business Case Template

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Community Activation Program

Introduction

The Community Activation Program (CAP) serves as a comprehensive framework and collaborative community designed to support industries in developing and implementing their own UNTP extension projects. Communities, supported by UNECE, continue to thrive long after the project is complete, aiding industries in adopting extensions and associated tools.

Recognizing the need for industry-wide collaboration to address challenges such as interoperability and costs, CAP offers structured solutions. Corporations often prefer not to act in isolation due to the risks and challenges associated with independent initiatives; CAP addresses this by fostering collective action, enabling industries to achieve shared goals through collaboration and mutual support. By leveraging a unified methodology, comprehensive toolkit, open-source software platforms, and globally recognized standards, CAP empowers industries to reduce costs, improve efficiency, and build trust among stakeholders, including regulators, financial institutions, and software vendors. This fosters deeper collaboration and shared benefits across sectors.

Through CAP, industries can assess the value of their extension projects and effectively engage diverse stakeholders to drive adoption.

Starting a UNTP project requires careful consideration of specific foundational elements that ensure the project's alignment with industry needs and its potential for widespread adoption. These include:

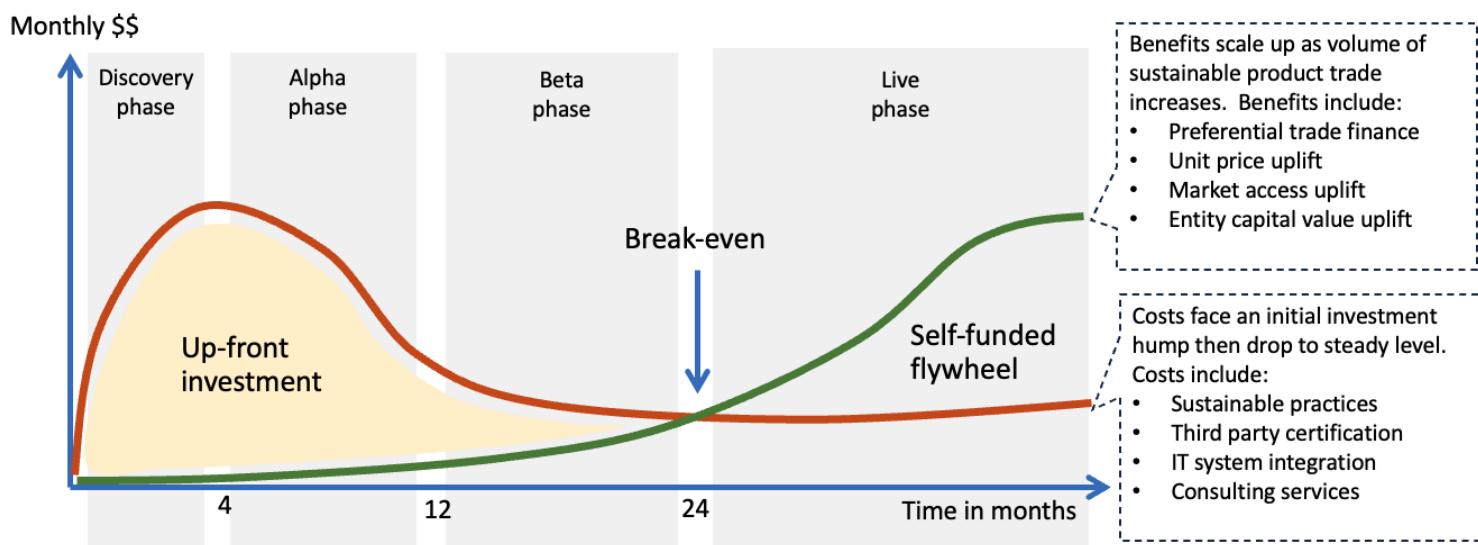
- **Catalyst for adoption:** Identifying a clear and compelling driver for the project, such as new regulatory requirements (e.g., EUDR or Carbon Border Adjustment Mechanism), or the need to align with a national or sectoral traceability strategy, provides focus and urgency for stakeholders.
- **Engaged buyers:** Buyers must perceive significant value in supplier data, such as enhanced product quality, compliance assurance, or risk mitigation. This engagement is essential to drive demand for the project outcomes.
- **Committed suppliers:** Suppliers must be willing and able to share critical data with buyers, especially when the project demonstrates a direct benefit to them, such as cost reductions, increased market access, or reputational gains.
- **Funding mechanism:** Robust and sustainable funding is crucial for supporting the project's initial phases, covering development, outreach, and pilot testing. This ensures that the project gains traction and delivers early successes to build momentum.

CAP delivers value to industries and creates a flywheel of adoption

Industry associations engaging with CAP to develop UNTP extensions benefit from:

- Shared costs and reduced financial risks for members.
- Increased value proposition for association membership.
- Enhanced trust and credibility within industries and stakeholders.
- Accelerated momentum for product passports, trust services, and registries.
- Alignment with emerging extensions, solving interoperability challenges.
- Access to global experts, case studies, and robust tools.

As extension projects mature, they generate a self-sustaining flywheel effect. This mechanism drives innovation and growth by aligning stakeholders, fostering collaboration, and incentivizing continuous improvement. By enabling shared benefits, CAP ensures long-term progress and success.



CAP supports a structured approach to extension development and adoption

The CAP toolkit offers a proven, six-phase methodology:

Inception Phase: This initial phase is centered on identifying key catalysts for change, such as emerging regulations, national traceability strategies, or industry-specific challenges. Stakeholders work collaboratively to build consensus, define project goals, and create a compelling business case that articulates value. Communities may already exist and catalyze around a pressing business problem, identifying UNTP as the most effective solution. At the end of this phase, a community may formally register their extension with UNTP, solidifying their commitment and alignment with global standards. Securing initial funding ensures the project is adequately resourced for success.

Discovery Phase: In this exploratory phase, current practices are systematically mapped to identify strengths, gaps, and opportunities. Stakeholders prioritize areas for improvement and establish clear objectives that align with industry needs and regulatory demands. This phase sets the foundation for a targeted and actionable implementation plan.

Alpha Phase: During the alpha phase, prototypes of the proposed systems and frameworks are developed and tested within controlled environments. This stage allows stakeholders to assess functionality, refine tools, and demonstrate tangible value to participants. Feedback loops are critical in ensuring the solution is robust and addresses real-world challenges effectively.

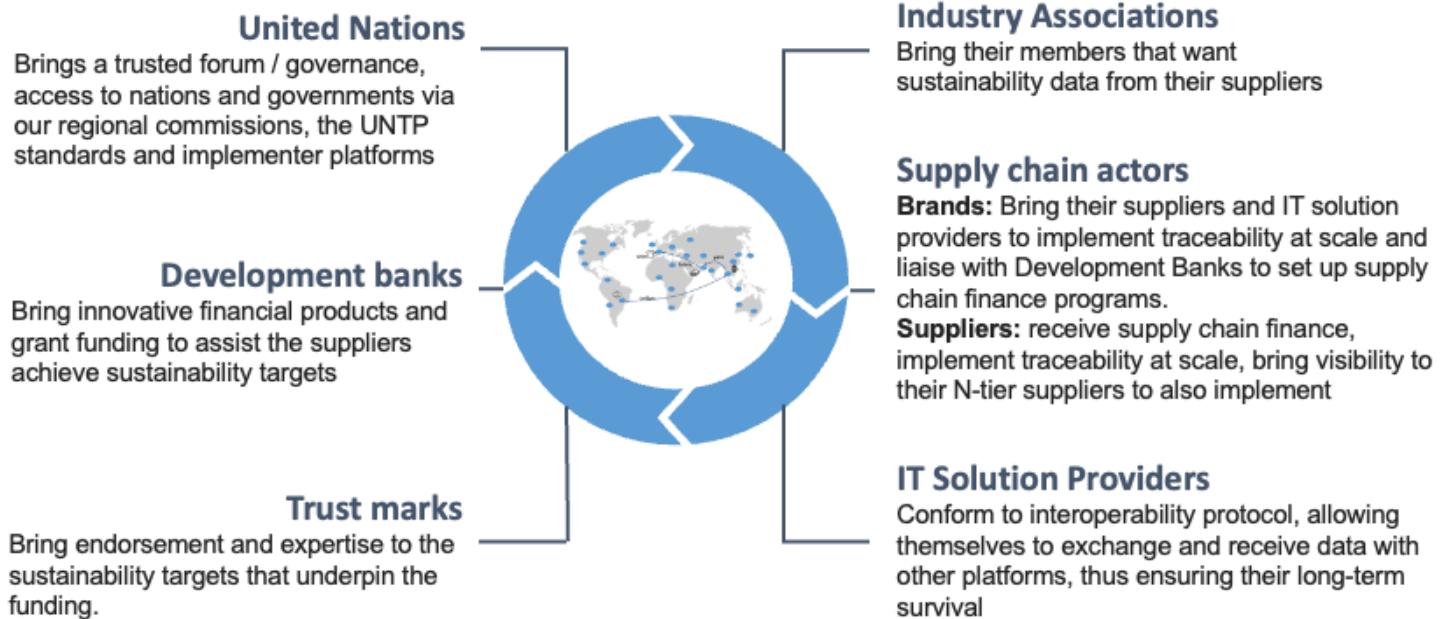
Beta Phase: Building on the alpha phase, the beta phase scales the project to a broader set of participants. Emphasis is placed on resolving interoperability challenges, ensuring compatibility with existing systems, and refining operational workflows. The project is tested in live scenarios to validate its scalability and effectiveness.

Live Phase: The final phase transitions the project into full-scale implementation. Stakeholders work to achieve widespread adoption, leveraging continuous improvement mechanisms to adapt to evolving industry needs. This phase ensures the extension remains sustainable, impactful, and aligned with broader industry objectives.

[More on the methodology here.](#)

A successful UNTP extension project is a team effort

UNTP extension projects thrive through collaboration with a wide range of stakeholders.



CAP member stakeholders bring unique needs and derive tailored benefits:

- **Industry associations:** Drive collective industry efforts by providing leadership and fostering collaboration to develop interoperable standards, ensuring enhanced member value and a unified industry voice.
- **Suppliers:** Contribute essential data that ensures compliance with ESG standards and enables access to broader markets. Their participation demonstrates alignment with global sustainability efforts and supports trust across supply chains.

- **Buyers:** Play a pivotal role by demanding traceability and guiding the adoption of data standards. This ensures reliable and transparent information flow, bolstering brand trust and improving consumer confidence.
- **Trust marks and government agencies:** Provide critical policy frameworks and credentials that establish the credibility of sustainability efforts. They ensure alignment with environmental, social, and governance (ESG) goals and offer a foundation for industry-wide adoption.
- **Development banks:** Facilitate sustainable growth by offering ESG-linked financing and investment mechanisms. These institutions provide crucial resources that reduce financial barriers and encourage broader participation in UNTP extension projects.
- **IT solution providers:** Deliver the technical expertise needed to develop traceability systems and ensure seamless data interoperability. Their innovations enable scalable and robust solutions for managing complex supply chains.
- **UNECE:** Act as a global steward, offering governance frameworks that ensure alignment and interoperability across projects. Their involvement fosters cooperation, providing guidance that strengthens the foundation for sustainable and globally consistent practices.

A UNTP extension team requires specialist skills

To deliver a successful extension project, teams require a range of specialist skills. In addition to deep industry knowledge brought by the industry association and its members, a project should have:

- **Project management expertise:** Successful execution of UNTP extension projects relies heavily on effective project management. Teams must coordinate a wide range of activities, oversee resource allocation, and ensure that milestones are achieved on time. They must navigate complex interdependencies while maintaining a clear focus on objectives.
- **IT systems knowledge:** Teams need expertise in deploying and integrating advanced tools for data exchange, supply chain tracking, conformance testing, and process automation. Knowledge of software compatibility, system scalability, and data security is vital to ensure seamless operations.
- **Trust architecture expertise:** A trust architect is essential in ensuring that the systems and frameworks designed foster credibility and reliability among stakeholders. This role involves creating mechanisms to validate and certify data integrity, establishing clear accountability processes, and building frameworks that enhance trust across supply chains. Trust architects play a pivotal role in ensuring all participants have confidence in the system, paving the way for sustained adoption and collaborative success.
- **ESG standards expertise:** Proficiency in environmental, social, and governance (ESG) standards is critical for aligning projects with global sustainability goals. This includes implementing ESG frameworks, tracking compliance, and producing transparent reports that enhance trust among stakeholders.
- **Stakeholder engagement skills:** Effective communication and relationship management are essential for fostering collaboration among diverse participants. Teams must balance competing interests, mediate conflicts, and build consensus to align priorities and drive collective action.

- **UNTP extension knowledge:** Deep understanding of the UNTP framework is indispensable for designing and implementing extensions that meet global standards. Teams must navigate trade protocols, ensure data governance, and address technical interoperability challenges to deliver scalable and impactful solutions.

CAP membership provides access to valuable resources

As a member of the Community Activation Program, members can access a wide range of resources:

- **Frameworks and toolkits:** The UNTP Business Case Templates and traceability frameworks provide a comprehensive foundation for project planning. These tools are designed to streamline decision-making processes, ensuring that stakeholders can effectively map out goals, objectives, and resource requirements. The templates also offer guidance for measuring and communicating the value of UNTP extensions to participants and decision-makers.
- **UNECE guidance:** The UNECE plays a pivotal role in ensuring global alignment and promoting interoperability through its lightweight governance framework. By offering strategic guidance, the UNECE ensures that extension projects remain consistent with international standards, thereby fostering cooperation across borders and industries. This guidance reduces redundancies and ensures projects are sustainable and impactful.
- **Consultant support network:** Expert advisors provide indispensable support throughout each phase of the project. Their deep understanding of UNTP frameworks and industry best practices ensures that projects are both scalable and aligned with stakeholder needs. Consultants can help troubleshoot complex challenges, streamline workflows, and ensure that all participants achieve their objectives. [to be discussed]
- **Collaboration networks:** Engaging with established UNTP extension programs offers valuable opportunities for shared learning and innovation. These networks allow new participants to benefit from the experiences of others, adapt proven methodologies, and align their projects with broader industry goals. Collaboration also strengthens the ecosystem, making it easier for new extensions to integrate seamlessly.
- **Software tools:** A suite of software solutions is available to support UNTP extension projects. These tools facilitate rigorous testing, ensure conformance with established standards, and simplify supply chain management processes. By automating critical workflows and enabling data interoperability, these tools reduce the complexity of project implementation and drive efficiency.

Starting a community is simple

- **Join the community:** Join the [UNTP chat channel](#) to connect with a UNTP leader and discuss your community needs. By joining the community, participants gain access to ongoing support, exclusive updates, and a global network of peers dedicated to advancing UNTP standards.
- **Download the CAP toolkit:** Access resources, including methodologies, templates, and tools. This comprehensive toolkit is designed to guide organizations through every phase of a UNTP extension project, providing detailed frameworks for planning, execution, and evaluation. [Toolkit Download](#)
- **Engage with other programs:** Collaborate with established communities for shared learning and best practices. These connections allow participants to align their projects with proven methodologies, reducing duplication of effort and accelerating implementation timelines. [Extensions Register](#)

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Ongoing Value Asessment

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Case Studies

TBD

Specification

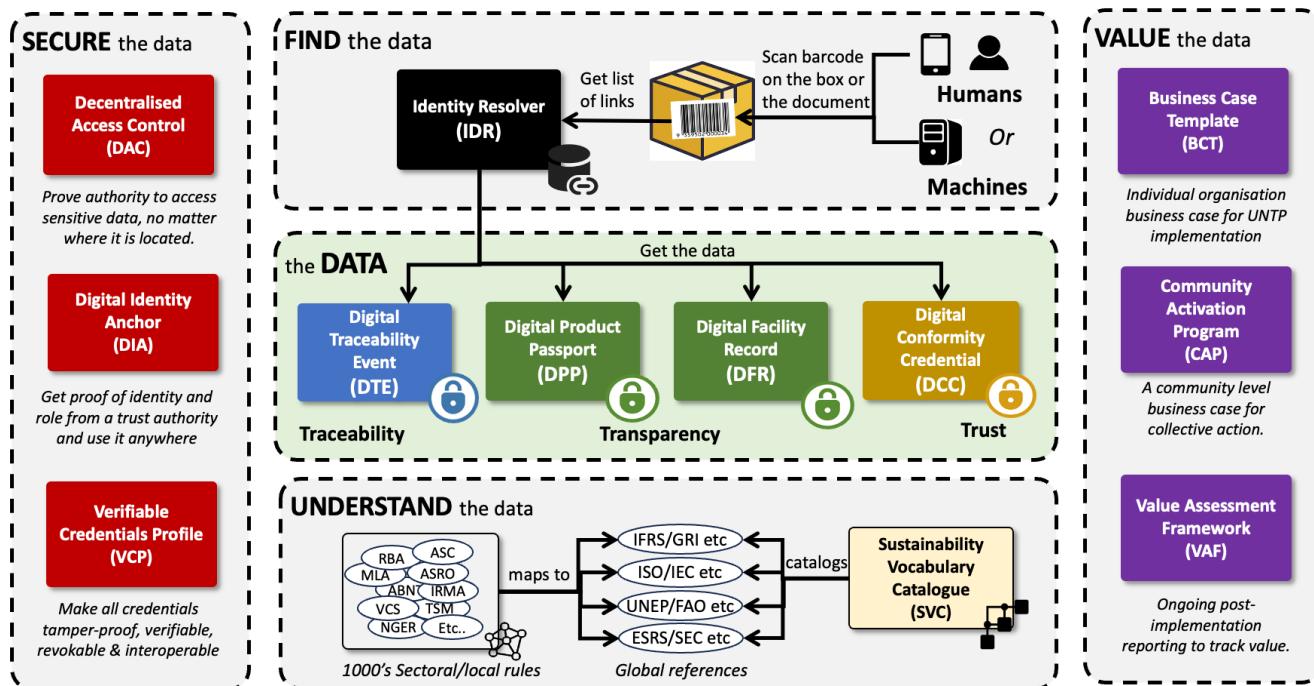
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The specification is the heart of UNTP. It defines the detailed specifications for interoperable implementations.

Architecture

The architecture is the blueprint for all the components of the specification and how they work together. It defines the **design principles** which underpin the UNTP and shows the components working together from the perspective of a **single actor** and across the **entire value-chain**. The UNTP is a fundamentally **decentralised architecture** with no central store of data.



Please refer to the [Architecture](#) page for more details on each of the UNTP components shown in the diagram above.

Specifications

UNTP is broken into several distinct and separately implementable components so that each actor can implement only what is relevant for their role.

- The [Sustainability Vocabulary Catalog](#) is for scheme owners and regulators to publish their rules and criteria so that they can be unambiguously referenced by conformity claims about products or facilities.
- The [Identity Resolver](#) and [Digital Identity Anchor](#) are for operators of authoritative registers of businesses, facilities, trademarks, and products so that their members can prove their identity and link their identifiers to rich data like products passports and facility records.
- The [Digital Product Passport](#) and [Digital Facility Record](#) is for supply chain actors to securely publish discoverable information about their products and facilities, including sustainability claims.
- The [Digital Conformity Credential](#) is for conformity assessment bodies to issue third party assessments of products and facilities so that greater trust can be associated to the claims made by product and facility owners.
- The [Digital Traceability Event](#) provides a means for supply chain actors to map the output products to input materials as well as logistics providers and service centres to record post sale events about products.
- The [Verifiable Credentials Profile](#) and [Decentralised Access Control](#) specifications are underlying technical capabilities that would be supported by any software system that is used by supply chain actors that implement UNTP.

Please refer to the [Implementation Guidance](#) section for more information on how to build and test your UNTP implementations.

Best Practices

Although each UNTP specification is an independently implementable component, the greatest value is released when multiple different actors each play their role. The [Best Practices](#) section describes how UNTP components work together across complex value chains.

- [Transparency Graphs](#) describes the picture of the entire value chain that emerges as more and more actors implement UNTP. It uses the example of critical minerals as raw materials that are eventually consumed by electronics and automotive sectors through a complex web of intermediate fabricators and component manufacturers. Although each information component such as product passports and facility records are independently verifiable, the message of the transparency graphs section is that it is really the "graph" of connected and related data elements that is the key to validation of high integrity transparent supply chains.
- [Anti-Counterfeiting](#) describes how actors that implement UNTP to provide high integrity product transparency information can also leverage the same integrity measures as a powerful anti-counterfeiting measure. Particularly when trademark registers provide their members with UNTP Digital Identity Anchor credentials that can be used to cryptographically connect genuine products to their trademark ownership.
- [Chain of Custody](#) is focussed on one of the most important challenges of supply chain traceability and transparency - which is how to manage the accurate and verifiable mass-balance allocation of sustainability performance when there are mixed batches of bulk materials with different characteristics using in manufacturing processes.

Architecture

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Overview

The architecture is the blueprint for all the components of the specification and how they work together. It defines the **design principles** which underpin the UNTP and shows the components working together from the perspective of a **single actor** and across the **entire value-chain**. The UNTP is a fundamentally **decentralised architecture** with no central store of data.

Principles

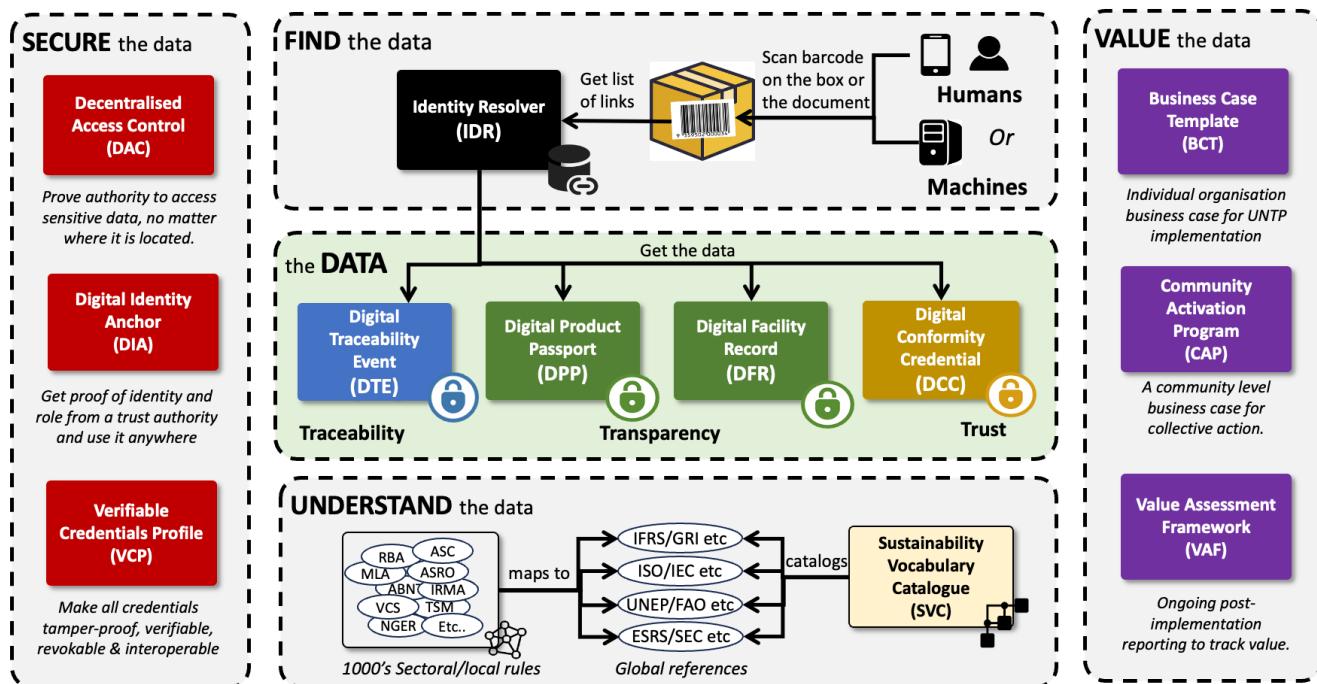
The architecture principles that guide the UNTP design are

Name	Principle	Rationale
No dependency	UNTP should not require any collaboration or dependency between issuers, consumers and verifiers of DPPs	Imposing such collaboration as a pre-requisite for action in a complex many-to-many ecosystem would essentially stall progress
Unknown verifier	UNTP should not assume that the consumer / verifier of UNTP data is known to the issuer, even when confidential data access is required	In a decentralised architecture with thousands of issuers, it would be impractical to register every authorised verifier with every issuer.
Any maturity	UNTP should not assume any technical maturity for verifiers	DPPs and other credentials must work equally for human and machine verifiers - otherwise an insurmountable complexity of knowing which customer has what capability would be required
Legacy data carriers	UNTP should work with any carrier of a product identifier including 1D barcodes, RFID tags, 2D codes and digital documents	1D barcodes and RFID tags are ubiquitous and will only be replaced slowly. Uptake should not require manufacturers to re-instrument their production lines and printing processes

Name	Principle	Rationale
Verifiability	UNTP should provide confidence in the integrity and trustworthiness of the data	Without trustworthy data, the value of sustainability claims is reduced - possibly to the extent that the business case for adoption is non viable.
Any criteria	UNTP should not dictate any specific sustainability criteria but make the criteria transparent and allow criteria to be mapped (to achieve interoperability)	Costs will explode if every exporter must provide certification to every export market criteria. Where criteria are equivalent, mutual recognition provides a much more cost effective sustainability trajectory.
Action requires value	The benefits of UNTP implementation must exceed the costs.	If not then there will be no implementation

UNTP conceptual overview

Our mission is to support global traceability and transparency **at scale**. To achieve that mission we must not only define the **data** standards but also solve all the barriers to adoption as scale. That includes how to **find** the data, how to **secure** the data, how to **understand** the data, and most critically, how to realise enduring business **value** from the data. These are the five pillars of UNTP.



Small scale tests are possible with any of these pillars missing but scalability to full production volumes is not.

The data

The data is the heart of the UNTP. There are four different data types.

- The **Digital Product Passport (DPP)** is issued by the product manufacturer and is designed to carry basic product data plus the conformity data (including sustainability assurance data) that is needed by the next actor in the supply chain (ie the buyer of the product). The DPP represents the conformity information as a set of "claims" that specify product performance against specified criteria. In this way, the DPP is essentially a bundle of differentiated value that a buyer can use to choose a preferred supplier. The DPP also provides a statement of material provenance (ie what materials is this product made from and where were the materials sourced). The provenance data assist with ensuring conformance to minimum local content rules or sources under sanction.
- The **Digital Facility Record (DFR)** is issued by the owner or operator of a facility such as a mine, a farm, a material processing plant, a component manufacturing site, or a recycling plant. It is similar to a product passport but provides facility level information rather than product level information. The data includes some basic facility data, geolocated facility boundary information, data about bulk materials and product types produced by the facility, and a set of conformity claims (eg emissions footprint, deforestation status, etc).
- The **Digital Conformity Credential (DCC)** is issued by an independent auditor or certifier and it carries one or more "assessments" of an identified product or facility against well defined criteria. When the product ID and the conformity criteria in the DCC "assessment" match those in the DPP "claim" then the DPP data value is enhanced through independent verification. The DCC must include the identity of the accreditation authority and, where relevant, links to the accreditation authority, so that verifiers can be sure that the auditor or certifier is genuine.
- **The Digital Traceability Event (DTE)** provides a means to trace product batch data throughout the value chain. The DTE links input products (eg bales of cotton from the primary producer) to output products (eg woven cotton fabric). Therefore the DTEs provide a means to trace product provenance through manufacturing processes to discover an entire value chain. DTEs are only available when products are managed and traceable at batch level. DTEs provide links to reach deeper into the value chain which may contain commercially sensitive data and so may only be available to authorised roles.

All four UNTP data structures are designed to be extensible to meet the needs of specific industry sectors or jurisdictions.

Finding the data

We deliberately say "finding" the data rather than "exchanging" the data because a very critical principle is that the issuer of the data usually will not know who will ultimately use it. Obviously each seller knows their immediate buyer but many other actors in a circular economy may also encounter the identified product and need to access the DPP information. It follows that a key principle of UNTP is "if you know the identifier of a product then you can get the data about the product" - even many years after the product was created.

- **Identity Resolver (IDR)** specifications are a concretisation of ISO/IEC 18975 that provide a standardised way to resolve an identifier (of a product, batch, item, facility or entity) to a list of links (URLs) to further information about the identified object. The format of the linkset itself is defined by [RFC9264](#). One identifier can resolve to multiple links, each of which is annotated with a specific link type (eg UNTP DPP). The IDR works with simple identifiers (eg encoded as a traditional 1D barcode) or complex identifiers (eg encoded as a QR code). In this way a single barcode or QR code can return a rich variety of information tailored to the requestor's needs. Furthermore, the IDR can return a collection of similar types of link with different date stamps or versions. One important use case for this capability is to return post-manufacture events such as consumption and eventual recycling of identified products.

Securing the data

As the value of sustainability attributes increases, so the temptation to make fake claims increases. Without confidence in the integrity of data, value is diminished. Additionally, as businesses publish more and more data about their products and upstream value chains, there is an increased risk of leakage of commercially sensitive information. Without confidence that sensitive data is accessible only to authorised parties, businesses will be less likely to participate. The UNTP security specifications address these challenges.

- **Verifiable Credentials Profile (VCP).** All UNTP data objects (DPP, DCC, DTE, DIA) should be issued as W3C Verifiable Credentials. This ensures that the data, once issued, cannot be tampered with, that the issuer is identifiable, and that status changes like revocation are immediately visible. The VCP defines a simple subset of the larger W3C specifications so that interoperability is simpler and cheaper to achieve. The VCP also includes an human-readable rendering template extension to the W3C specification so that anyone can verify UNTP credentials even if they have no technology maturity.
- **Digital Identity Anchor (DIA).** The issuers and subjects of Verifiable Credentials are identified using W3C Decentralised Identifiers (DIDs) which provide a means to discover the cryptographic keys necessary to verify the credentials. However, DIDs are self-issued and do not ensure that the issuer is really who they say they are, only that the owner of the DID was certainly the issuer of the credential. The DIA is a Verifiable Credential issued by a trusted authority (eg a government agency) that links a DID to a known public identity such as VAT registration number. In this way, verifiers can be assured of the identity of issuers. The DIA also has a "scope" so that, for example a national accreditation authority can attest to the identity of a certifier but also specify the scope of the accreditation.
- **Decentralised Access Control (DAC).** Not all traceability and transparency data for a given product is public information. Some is accessible only to authorised roles like a customs authority or a recycling facility. Some is accessible only to the verified purchaser of a product. In centralised systems, this kind of access control is managed by granting privileged access roles to authenticated users. But in decentralised systems such as the world of DPPs, this approach is not practical. There could be thousands of different platforms that host DPPs and it would be impractical for each authorised actor to create accounts on thousands of systems. The DAC defines a simple way to encrypt sensitive data with a unique key for every unique item and a way to distribute decryption keys to authorised roles without any advance knowledge about who has which role. Even if a decryption key is lost or leaked, the scope of data access is limited to one item. The DAC also provides a mechanism for the verified purchaser of an item to **update** the DPP record with post-sale events like consumption, repair, or recycling.

Understanding the data

The UNTP data objects (DPP, DCC, DTE, DIA) are deliberately simple so that they are easy to understand and low cost to implement. However a lot of the structural simplicity of a DPP is achieved via the "claims" object which is a simple abstraction that can carry any sustainability or conformity metric measures against any criteria from any standard or regulation. So this simple abstraction hides a world of complexity. In a world of thousands of standards or regulations, each with dozens or hundreds of distinct criteria, how can one claim about social welfare or biodiversity be meaningfully compared to another? How can an importer know whether a product sustainability criteria from an exporting economy is equivalent to the regulated criteria in the importer's economy? As a corporate subject to sustainability disclosures under IFRS or ESRS, how can I know how to match the claims in a received product passport with the impact areas of my disclosures statement? The UNTP cannot and should not dictate which sustainability standards or regulations any given claim or assessment references. However it can provide a way to map these criteria to a harmonised vocabulary to achieve interoperability.

- The **Sustainability Vocabulary Catalog (SVC)** defines a framework to map sustainability and compliance criteria across different standards, regulations and industry practices. The framework also allows unstructured product, facility, or entity

evidence documents to be assessed against compliance criteria, indicating where there are gaps and opportunities to improve compliance. The framework is based on an AI architecture called [Retreival Augmented Generation](#) and aims to provide organisations with a fast and efficient mechanism to quickly assess a complex set of compliance requirements.

As uptake of UNTP grows, maintenance of the SVC is one of the key activities that grows with uptake and adds continuously increasing value to the global sustainability effort.

Valuing the data

Without sufficient commercial incentive, businesses will not act. In some cases the commercial incentive is regulatory compliance. But few economies (The European Union is a notable exception) have current or emerging regulations that demand digital product passports for products sold or manufactured in their economy. However, there is much wider regulatory enforcement of annual corporate sustainability disclosures. But without sustainability data from supply chains at product level, there is no easy way for corporates to accurately meet their annual disclosure obligations. Worse, without product level data from suppliers, there is no way at all for corporates to select suppliers in such a way that they can demonstrate year-on-year improvements to sustainability performance. On top of the disclosure obligation, most corporates are very concerned about reputational risk associated with un-sustainable behaviour from their upstream suppliers. Furthermore, the financial sector is increasingly able and willing to provide improved financial terms for trade finance or investment capital to businesses with strong sustainability credentials. All these incentives drive behaviour and value but there is still some effort needed for each implementer to make a positive business case for change. UNTP offers some tools to determine the value that can inform a positive case for change.

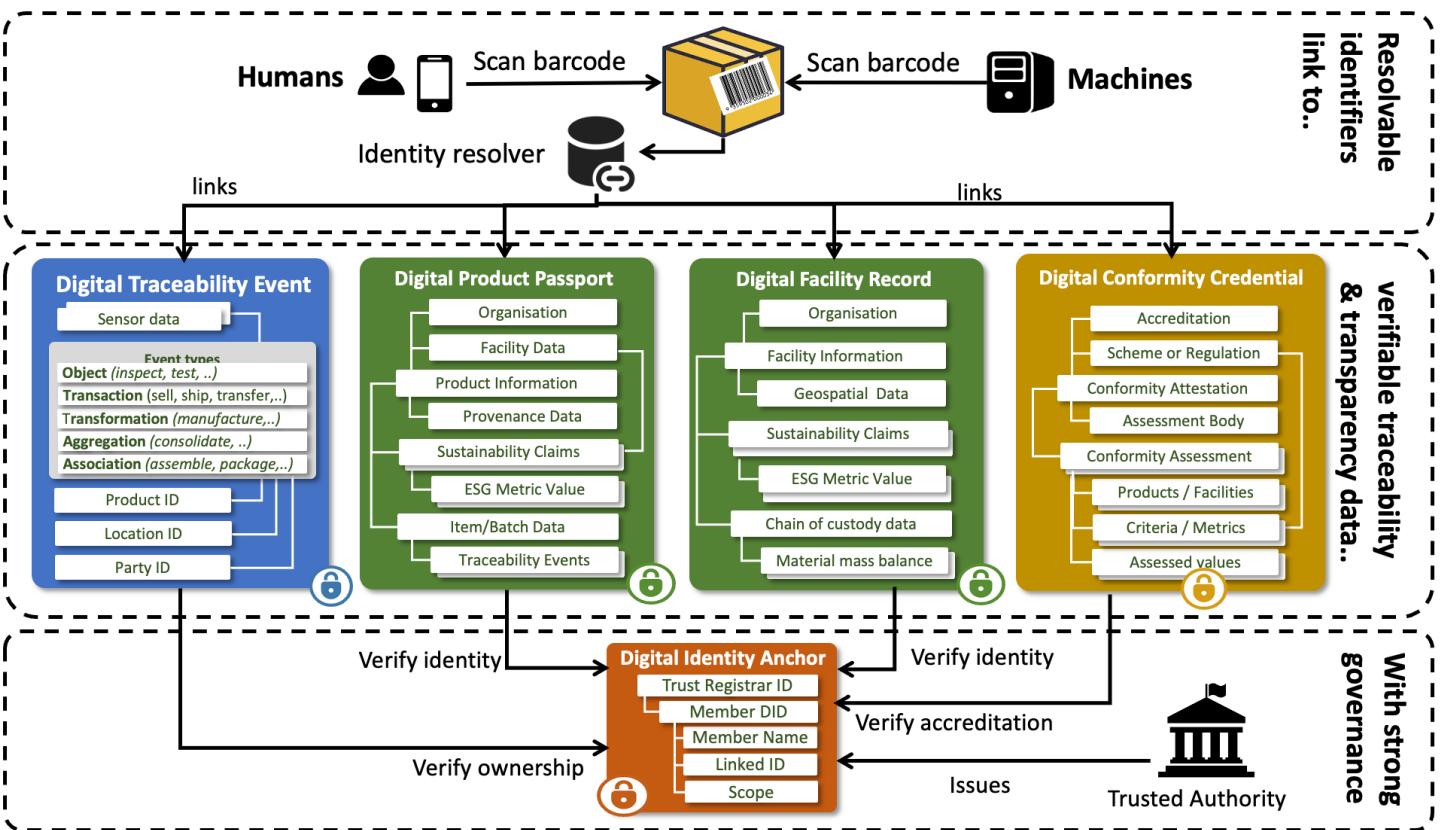
- **Business Case Template (BCT).** A simple template for each role (buyer, supplier, certifier, software vendor, regulator, etc) to make a business case for the investment needed to implement UNTP. Continuously updated and improved with lessons from early implementations, the BCT provides a quick way for sustainability staff to support their budget requests.
- **Community Activation Program (CAP).** Supply chain actors are often reluctant to proceed with a specific initiative like UNTP unless they have some confidence that others in their industry are doing the same. There are not only obvious interoperability benefits from industry-wide adoption but also cost benefits. For example, it is often the case that a small number of commercial software platforms are commonly used by larger numbers of businesses in a given industry and jurisdiction. So a software vendor that implements UNTP once will benefit all its customers. Additionally there are often a few standards and a few certifiers that are common to an industry and country. Likewise, there are very often one or more existing member associations that represent most of the actors in a given industry and country. Finally, when a large community is willing to act together, there will often be financial incentives from governments and/or development banks that can assist with initial funding. In short, there are many reasons to approach UNTP implementation at a community level. The CAP is a business template for a community level adoption of UNTP including a tool for financial cost/benefit modelling at community level.
- **Value Assessment Framework (VAF).** Once a community or individual implements UNTP and transparency data starts to flow at scale, it will become important to continuously assess the actual value that is realised. Dashboards and scorecards that measure key performance indicators will energise ongoing action and provide valuable feedback at both community and UN level. Therefore the UNTP defines a minimal set of KPIs that each implementer can easily measure and report to their community - and which communities can report to the UN.

UNTP for one actor

This section drills down a little into the key credentials that UNTP defines to answer "what's in a product passport or facility record or conformity credential or traceability event?". The diagram shows the perspective of one actor in the value chain that is publishing data about their facilities and products. The product identifier (at product, batch or item level) is the key for an Identity Resolver (IDR) to provide links to the UNTP credentials (and any other product related data). Every credential is both human and machine readable so that the same product scan will return a nicely formatted DPP and related data to a human scanning a barcode or QR code with their phone - or a structured digital data set to an automated scanner at the factory door.

Summary and detailed information about the content of each UNTP credential is available on this site and need not be repeated here

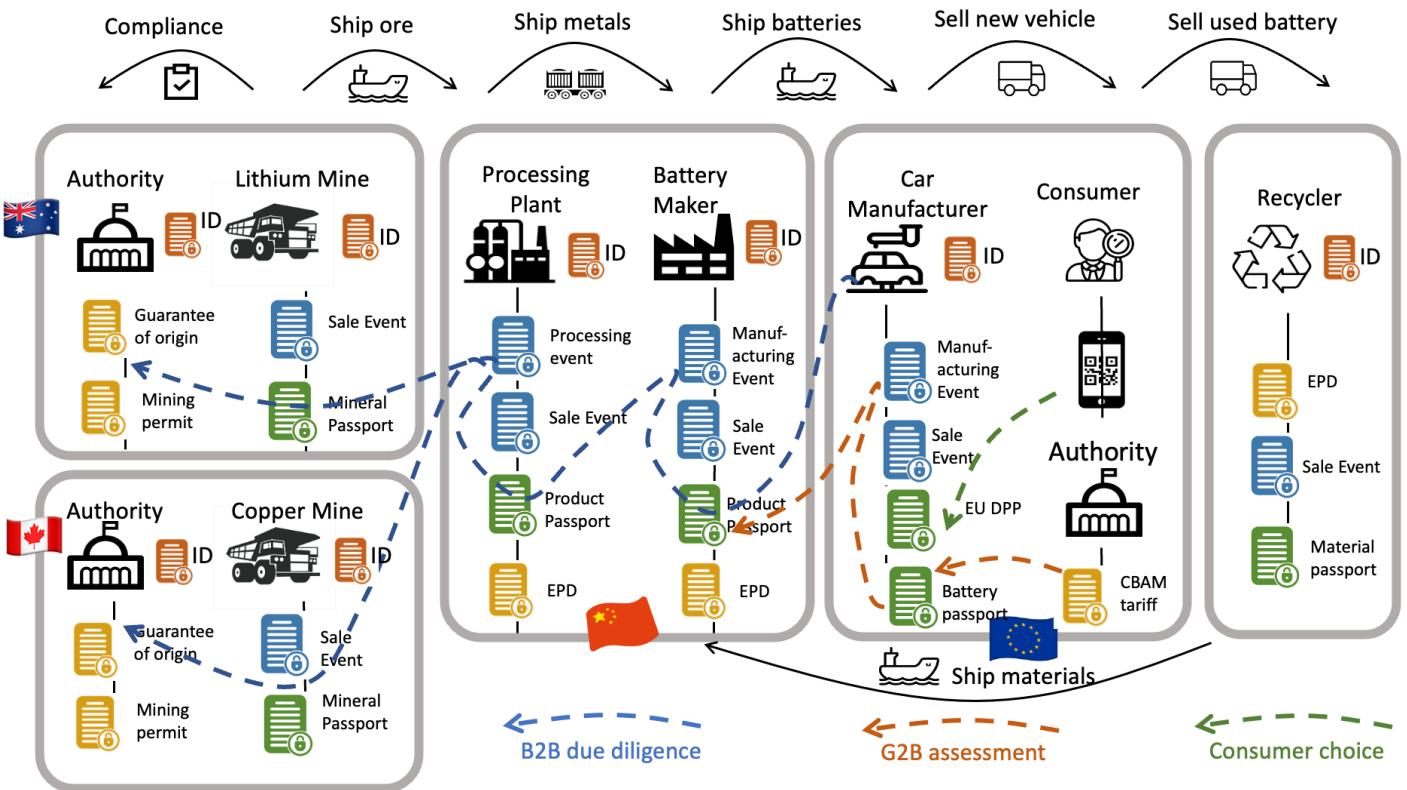
- Digital Product passport (DPP)
- Digital Conformity Credential (DCC)
- Digital Traceability Event (DTE)
- Digital Facility Record (DFR)
- Digital Identity Anchor (DIA)



UNTP for a value chain

When each actor in a value chain implements UNTP then it becomes possible to trace product provenance across value chains back to primary production. There is no need for all actors in a value chain to collaborate or to implement at the same time. In many cases, the timing and incentives in different industry sectors of the same value chain will be very different. For example a leather goods manufacturer will usually be unable to influence the behaviour of cattle farmers because leather is a by-product and their focus is on the food value chain. Nevertheless, when an agriculture sector implements UNTP for their own reasons, the leather manufacturer can still access the data because UNTP provides a traceability mechanism that crosses industry

boundaries without requiring collaboration between those industry sectors. In the example below, a battery can be traced to raw material production even when, from the perspective of the miner, the copper in the anode represents a tiny fraction of production.



Verifiable Credentials

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Overview

The World-Wide-Web Consortium (W3C) has defined a [data model for Verifiable Credentials](#) (VCs). A VC is a portable digital version of everyday credentials like education certificates, permits, licenses, registrations, and so on. VCs are digitally signed by the issuing party and are tamper evident, privacy preserving, revocable, and digitally verifiable. The UN has previously assessed this standard and has recommended its use for a variety of cross border trade use cases in a recent [white paper](#). VCs are inherently decentralized and so are an excellent fit for UNTP which recommends that passports, credentials, and traceability events are all issued as W3C VCs. A related W3C standard called [Decentralized Identifiers \(DIDs\)](#) provides a mechanism to manage the cryptographic keys used by verifiable credentials and also to link multiple credentials into verifiable trust graphs. DIDs are not the same as the business / product / location identifiers maintained by authoritative agencies - but can be linked to them.

Business requirements for UNTP application of VCs

Verifiable Credentials technology is one of the key tools in the UNTP anti-green-washing toolbox. But there are many different technical implementation options which presents an interoperability risk - namely that credentials issued by one party will not be understandable or verifiable by another party. UNTP will not design new technical standards as that is the role of technology standards bodies such as W3C or IETF. However, by recommending the use of the narrowest practical set of technical options for a given business requirement, the UNTP can enhance interoperability.

A key design principle that is applicable to decentralized ecosystems such as UNTP recommends is [Postel's robustness principle](#) which, for UNTP, means that **an implementation should be conservative in its sending (issuing) behavior, and liberal in its receiving (verifying) behavior**. That is because the sustainability evidence that is discovered in any given value chain may be presented as many different versions of W3C VCs, or ISO mDL credentials, or Hyperledger Anoncreds, or as human readable PDF documents. Being as open as possible in what is received and verified will allow sustainability assessments to be made over a wide set of evidence. Conversely, choosing a narrow set of ubiquitous technology options when issuing UNTP credentials such as digital product passports will simplify the task of verifiers and minimise costs for the entire ecosystem.

ID	Name	Requirement Statement	Solution Mapping
VC-01	Integrity	VC technology recommendations must support tamper detection, issuer identity verification, and credential revocation so that verifiers can be confident of the integrity of UNTP credentials.	All VC options support this requirement
VC-02	Compatibility	VC technology recommendations for issuing UNTP credentials should be as narrow as practical and should align with the most ubiquitous global technology choices so that technical interoperability is achieved with minimal cost	Basic profile
VC-03	Human readable	VC technology recommendations must support both human readable and machine readable credentials so that uptake in the supply chain is not blocked by actors with lower technical maturity.	Render method
VC-04	Discovery	VC technology recommendations must support the discovery and verification of credentials from product identifiers so that verifiers need not have any a-priori knowledge of or relationship to either the issuers or the subjects of credentials.	Presentations
VC-05	Semantics	VC technology recommendations must support the use of standard web vocabularies so that data from multiple independent credentials can be meaningfully aggregated.	Vocabularies
VC-06	Performance	VC technology recommendations should value performance so that graphs containing hundreds of credentials of any size can be traversed and verified efficiently.	Basic profile
VC-07	Compliance	VC technology recommendations must meet any technology based regulatory requirements that apply in the countries in which credentials are issued or verified.	Basic profile
VC-08	Openness	VC DID method recommendations must not drive users towards closed ecosystems or proprietary ledgers so that there is no network effect coercion towards proprietary ledgers.	DID methods
VC-09	Portability	VC DID method recommendations must allow users (issuers) to move their DID documents between different service providers so that long duration credentials can remain verifiable even when issuers change service providers.	DID methods
VC-10	Evolution	VC technology is evolving and UNTP recommendations must evolve as newer tools and versions become ubiquitous	Roadmap

Verifiable Credential Profile

VCDM profile

The VC basic profile is designed to be as simple, lightweight, and interoperable as possible. A conformant implementation

- MUST implement the [W3C VC Data Model v2.0](#) using the JSON-LD Compacted Document Form
- MUST implement [W3C VC Bitstring Status List](#) for credential status management including revocation
- MUST implement [W3C-DID-CORE](#) using DID methods defined in [DID methods](#)
- MUST implement the enveloping proof mechanism defined in [W3C VC JOSE / COSE](#) with JOSE (Section 3.1.1)

DID methods

There are a large number of did methods listed in the [W3C did register](#). It is reasonable to expect that this proliferation of did methods will consolidate to a much smaller number of did methods, each designed to meet a specific business need. In future the UNTP may provide a did method decision tree with different methods for different use cases (eg legal entities vs products). In the meantime, a conformant implementation

- MUST implement the [did:web method](#) as an Organizational Identifiers
- SHOULD implement the did:web method using the web domain of the issuer to avoid portability challenges.

Note that there is activity within the VC technical community to define new did methods that achieve the ubiquity of did:web whilst still maintaining portability across web domains. For example [Trusted DID Web](#). This work may impact future UNTP DID method recommendations.

Render Method

To support uptake across supply chain actors with varying levels of technical maturity, human rendering of digital credentials is essential. A conformant implementation

- SHOULD use the `renderMethod` property as defined in the [VC data model](#).

Presentations

Verifiable Presentations (VP) are widely used in the verifiable credentials ecosystem to support holders to combine one or more credentials in a digital wallet and then present them for in-person or online verification purposes. The VP is signed by the holder did and so provides a holder binding mechanism. In UNTP supply chain implementations, the subject of most claims is an inanimate object (eg bar-coded goods) and digital credentials about the goods are discovered by any party that has access to the goods. The box of goods does not create verifiable presentations on demand and the binding is to the identity of the goods. A conformant UNTP implementation

- MUST issue and publish product passports, product conformity credentials, and traceability events as verifiable credentials and MUST include the identifier of the goods within the VC subject.

- MAY exchange these and any other credentials as verifiable presentations in wallet-to-wallet transfers or any other method.

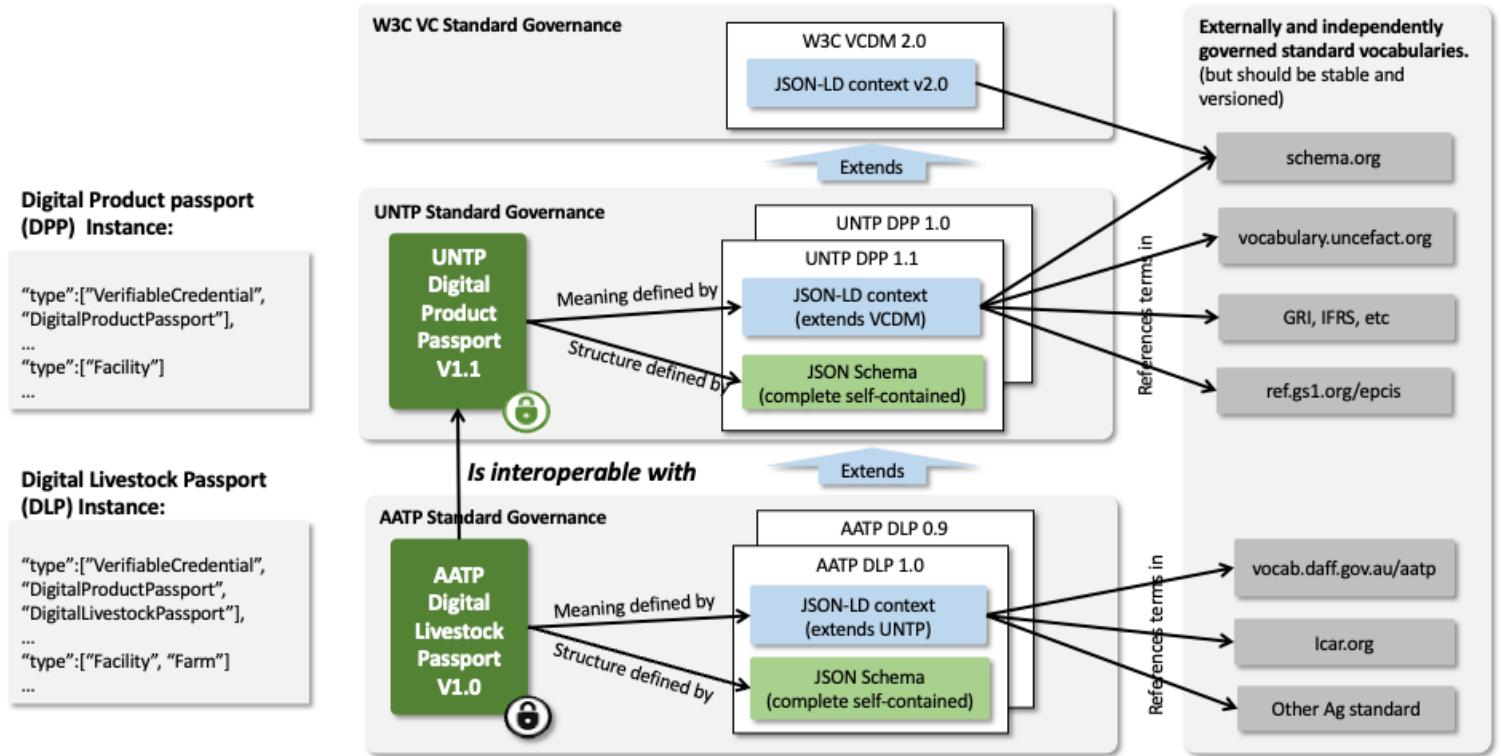
Vocabularies

A shared understanding of the meaning of claims made in verifiable credentials is essential to interoperability. To this end, conformant UNTP implementations

- MUST use the [JSON-LD](#) syntax for the representation of data in all issued credentials.
- MUST reference the relevant [UNTP @context](#) file for the given credential type. These context files are themselves extensions of the W3C VC Data Model 2.0 context.
- MAY extend credentials with additional properties but, if so, MUST include additional @context file reference that defines the extended properties. The @vocab "catch-all" mechanism MUST NOT be used.
- SHOULD implement widely used industry vocabularies such as [schema.org](#) as a first choice for UNTP extensions requiring terms not in the UN vocabulary.
- MAY use any other published JSON-LD vocabulary for any other industry or country specific extensions.
- MUST maintain @context files at the same granularity and version as the corresponding credential type. This prevents the risk of verification failures when context files change after credentials are issued.
- SHOULD provide a complete and versioned JSON schema for each credential type. This is to facilitate simple and robust implementations by developers without detailed knowledge of JSON-LD.

The data governance architecture for UNTP credentials is shown below. the key points to note are

- That credential instances contain Verifiable Credential Data Model (VCDM) type references for each uniquely identified linked-data object. Each extension builds upon parent types and is enumerated in the type array (eg `["Facility", "Farm"]`).
- UNTP @context types are [protected](#) and so MUST not be duplicated in extensions. Similarly UNTP @context does not duplicate [protected](#) terms in WCDM @context.
- Unlike @context files, the JSON schema for each credential MUST be a complete schema that defines the entire credential including terms from VCDM and UNTP.



Roadmap

Future versions of this specification will

- Provide richer guidance on did methods via a decision tree that helps to select the right method for the right purpose
- Provide guidance on selective redaction methods to better support confidentiality goals.
- Provide timelines for transition between versions of technical specifications

Digital Product Passport

!(Info)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artifacts

Are maintained at <https://test.uncefact.org/vocabulary/untp/dpp/0/about>

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due in June 2025 after formal public review

Release for Pilot Testing

Version 0.6.0 release artifacts can be used for pilot testing.

- [JSON-LD @context](#)
- [JSON Schema](#)
- [Sample JSON Instance](#)

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

Ontology

The ontology for the Digital Product Passport is available in JSON-LD format and can be retrieved via content negotiation from:

<https://test.uncefact.org/vocabulary/untp/dpp/0/>

Example:

```
curl https://test.uncefact.org/vocabulary/untp/dpp/0/ -H 'Accept: application/ld+json'
```

Version History

History of releases is available from the [Version history](#) page.

Default Render Template

A UNTP digital product passport may be rendered in any format desired by the issuer. However a default [Template Design](#) is provided here and includes mapping of visual rendering elements to the [Logical Data Model](#).

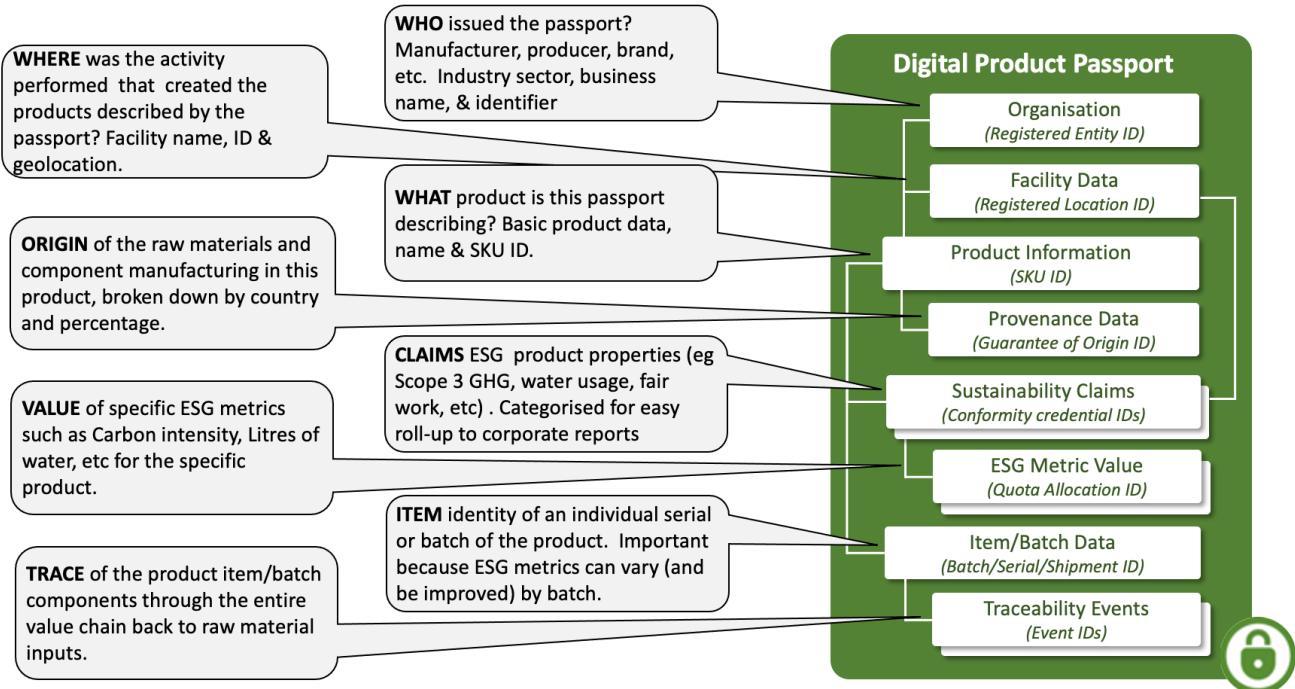
Sample Credential

URL	QR	Description
Sample Digital Battery Passport		A sample digital product passport as a JWT envelope signed Verifiable Credential. The URL (or QR scan) resolved to a hosted verifier that displays a human readable version. Raw JSON data can be viewed via the JSON tab and the full credential can be downloaded via the download button.

Overview

The digital product passport (DPP) is issued by the shipper of goods and is the carrier of **product and sustainability information** for every serialised product item (or product batch) that is shipped between actors in the value chain. It is deliberately **simple and lightweight** and is designed to carry the minimum necessary data at the **granularity** needed by the receiver of goods - such as the scope 3 emissions in a product shipment. The passport contains links to **conformity credentials** which add trust to the ESG claims in the passport. The passport also contains links to **traceability events** which provide the "glue" to follow the linked-data trail (subject to confidentiality constraints) from finished product back to raw materials. The UNTP DPP does not conflict with national regulations such as the EU DPP. In fact, it can usefully be conceptualised as the **upstream B2B feedstock** that provides the data and evidence needed for the issuing of high quality national level product passports.

Conceptual Model



Requirements

The digital product passport is designed to meet the following detailed requirements as well as the more general [UNTP Requirements](#).

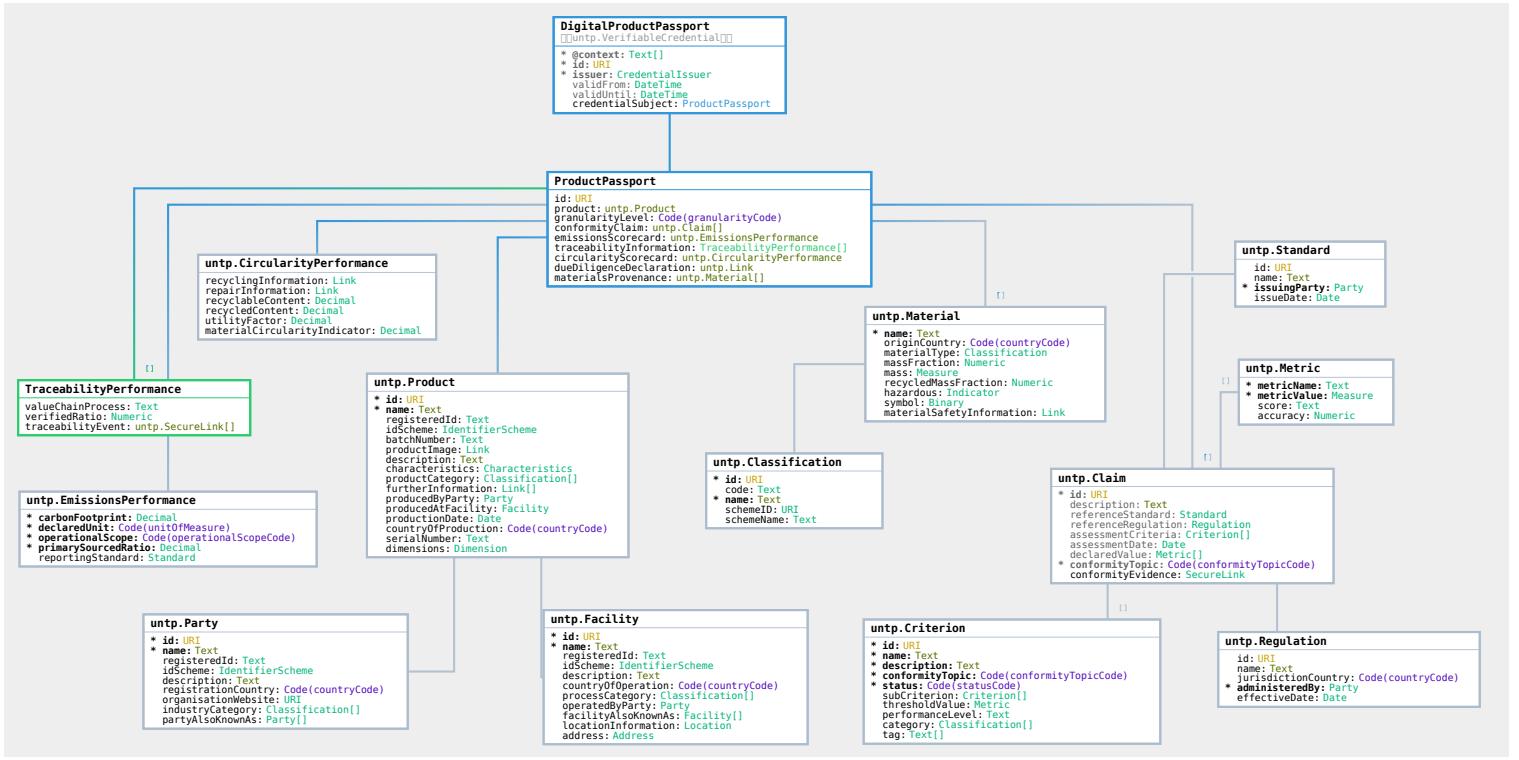
ID	Name	Requirement Statement	Solution Mapping
DPP-01	Granularity	The DPP should support use at either <i>model</i> level or at <i>batch</i> level or at serialised <i>item</i> level.	Claims are made at the passport level, which MUST have a related model and MAY have a related batch and item
DPP-02	Classification	The DPP should support any number of product classifications using codes from a defined classification scheme (eg UN-CPC)	The productCategory property
DPP-03	Materials provenance	The DPP should provide a simple structure to allow issuers to break down the material composition of their products by mass fraction and origin country so that raw material provenance requirements are easily assessed and met.	The DPP "materialsProvenance" structure is designed to meet this need.

ID	Name	Requirement Statement	Solution Mapping
DPP-04	Produced at	The DPP should provide a simple structure to describe the manufacturing facility at which the product was made. The facility identifier SHOULD be resolvable and verifiable and SHOULD link to cadastral boundary information.	The "Facility" structure including the location class is designed to meet this need
DPP-05	Dimensions	The DPP must support the definition of key product dimensions such as length, width, height, weight, volume so that conformity claims made at the unit level (eg Co2 intensity in Kg/Kg) can be used to calculate actual values for the shipped product	Dimensions class
DPP-06	Traceability	The DPP should provide a means to follow links to further DPPs and conformity credentials of constituent products so that (subject to confidentiality constraints), provenance claims can be verified to any arbitrary depth up to primary production	The links to ISO/IEC 19987 (EPCIS)-based traceability event credentials from the TraceabilityPerformance class is designed to meet this need
DPP-07	Characteristics	The DPP should allow an issuer to provide descriptive information about the product (image, description, etc) that is extensible to meet industry specific needs.	Characteristics property as an industry extension point
DPP-08	Verifiable Party	The DPP should provide DPP issuer, product manufacturer, and facility operator identification including a name, a resolvable and verifiable identifier, and proof of ownership of the identifier	DigitalProductPassport.Issuer Product.ProducedByParty, Product.ProducedAtFacility - all are uniquely identified objects and SHOULD have related resolvable Identity Resolver credentials
DPP-09	Claims	The DPP MUST provide a means to include any number of conformity claims within one DPP so that it can provide simple single point to aggregate all claims about the product in one place	The "conformityClaims" array is designed to meet this need
DPP-10	Conformity Topic	The DPP MUST provide a simple mechanism to express the sustainability/circularity/conformity topic for each claim so that similar claims can be grouped and the high level scope easily understood.	The ConformityTopic code list is designed to meet this need

ID	Name	Requirement Statement	Solution Mapping
DPP-11	Metrics	The DPP MUST provide a simple mechanism to quantify a conformity claim (eg carbon intensity, water consumption, etc) and to express any accuracy range and also to compare the claimed value to a relevant benchmark such as a standard/regulation requirement or an industry average	The "Metric" class is designed to meet this need
DPP-12	Criteria	The DPP MUST provide a means to reference a standard or regulation as well as the specific criteria within that standard or regulation - so that claims can be understood in terms of the criteria against which they are made.	Claim.referenceRegulation, Claim.referenceStandard, Claim.assessmentCriteria
DPP-13	Evidence	The DPP MUST provide a means to reference independent conformity assessments that support and verify the claims being made. The related evidence SHOULD be digitally verifiable but MAY be a simple document or web page. The confidence level attached to the evidence should be clear.	The Claim.conformityEvidence property references a relevant digital conformity credential

Logical Model

The Digital Product Passport is an assembly of re-usable components from the UNTP core vocabulary.



Core Vocabulary Documentation

The [UNTP core types vocabulary](#) defines the uniquely identified Linked Data entities such as Product, Location, Facility, Party, Standard, Regulation, Criteria, Declaration, Attestation, Endorsement. These entities provide the building blocks for construction of Digital Product Passports and Digital Conformity Credentials.

DPP Documentation

The [DPP documentation](#) provides a technology-neutral definition of classes, properties and code lists in the DPP model.

Implementation Guidance

This section provides sample JSON-LD snippets for each DPP component.

Verifiable Credential

All DPPs are issued as W3C Verifiable Credentials and MUST conform to the [VCDM 2.0](#). Also note that all identified objects (i.e. those with an "id" property) also have a "type" property that indicates the Linked Data type of the object. The "type" values must be defined in the associated [JSON-LD @context file](#). Key points to note from the VC sample below are:

- That the credential type is both a W3C "VerifiableCredential" and a UNTP "DigitalProductPassport". The DPP is an extension of the VCDM.
- That the "@context" reference similarly lists both the W3C VCDM context URL and the UNTP DPP context URL.
- The "id" is any globally unique reference for this specific DPP credential - typically a domain/UUID pattern.

- The issuer property, unlike most VC examples, is an object with multiple properties.
 - The object conforms to the UNTP "CredentialIssuer" type.
 - The id SHOULD be a DID and, if it is a DID then it MUST be a did:web.
 - The name property provides a human readable name of the issuer.
 - The array of "issuerAlsoKnownAs" is used to provide references to authoritative business identifiers for the issuer. In the example shown the issuer is also identified as an Australian Business with an ABN and link to the authoritative business register entry.
- The validFrom and validUntil fields are as defined in the W3C VCDM. They are optional but UNTP DPPs SHOULD include a validFrom date representing the date that the DPP was issued.
- The credential subject carries the bulk of the digital product passport information.

```
{
  "type": [
    "DigitalProductPassport",
    "VerifiableCredential"
  ],
  "@context": [
    "https://www.w3.org/ns/credentials/v2",
    "https://test.uncefact.org/vocabulary/untp/dpp/0.6.0/"
  ],
  "id": "https://example-company.com/credentials/2a423366-a0d6-4855-ba65-2e0c926d09b0",
  "issuer": {
    "type": [
      "CredentialIssuer"
    ],
    "id": "did:web:identifiers.example-company.com:12345",
    "name": "Example Company Pty Ltd",
    "issuerAlsoKnownAs": [
      {
        "id": "https://business.gov.au/ABN/View?abn=1234567890",
        "name": "Sample Company Pty Ltd",
        "registeredId": "1234567890",
        "idScheme": {
          "type": [
            "IdentifierScheme"
          ],
          "id": "https://business.gov.au/ABN/",
          "name": "Australian Business Number"
        }
      }
    ]
  },
  "validFrom": "2025-06-15T12:00:00Z",
  "validUntil": "2035-03-15T12:00:00Z",
  "credentialSubject": {
    "type": [
      "ProductPassport"
    ],
    "id": "https://example.com/id/9520123456788",
    ... remainder of product passport information goes here ...
  }
}
```

Product Passport

The `ProductPassport` object is the subject of the verifiable credential in the UNTP Digital Product Passport (DPP). It encapsulates detailed information about a specific product, including its identification details, manufacturer, and various claims such as sustainability, circularity, and traceability. Key points to note about the `ProductPassport` object are:

- The `credentialSubject` is of type `ProductPassport`, which includes a `product` attribute that contains the core product information (see the [Product](#) section below).
- `granularityLevel` indicates whether the DPP is issued at the product class level (e.g., all shoes of the same model), batch level, or serialised item level.
- `dueDiligenceDeclaration` is a link to a due diligence declaration that meets the legal requirements of the importing economy.
- `materialsProvenance` is an array of UNTP `Material` types that define the origin and characteristics of constituent materials in the product.
- `conformityClaims` is an array of `Claim` types that list the product quality or sustainability claims made by the manufacturer against criteria defined by a reference standard or regulation. The [sustainability vocabulary](#) accommodates diverse conformity criteria expressed by various standards and regulations.
- `circularityScorecard` is a simple object that defines the overall percentage of recycled content (and recyclable content) as well as links to recycling and repair information.
- `emissionsScorecard` defines the carbon footprint of the product against a defined reporting standard, the scope 3 boundaries, and the extent to which the data is accurately measured.
- `traceabilityInformation` is an array of `Link` objects that reference UNTP [Digital Traceability Events](#), providing traceability through the value chain via events such as the `TransformationEvent` that lists input and output product identifiers for a manufacturing process.

```
"credentialSubject": {
  "type": ["ProductPassport"],
  "id": "example:product/1234",
  "product": {
    // See Product section below for details
  },
  "granularityLevel": "batch",
  "dueDiligenceDeclaration": {},
  "materialsProvenance": [],
  "conformityClaim": [],
  "circularityScorecard": {},
  "emissionsScorecard": {},
  "traceabilityInformation": []
}
```

Product

The `Product` object is a core component of the `ProductPassport`, encapsulated within the `product` attribute of the `credentialSubject`. It defines detailed information about the specific product, including its identification, physical characteristics, and production details. Key points to note about the `Product` object are:

- The product identification comprises four properties that identify both the specific product and the identifier scheme, as defined by the UNTP `Product` type: `id` (a resolvable URI), `registeredId` (alphanumeric identifier), `idScheme` (the identifier scheme), and optionally `serialNumber` or `batchNumber`. The expectation is that the product `id` in the DPP will match the information printed on the physical product or its container (for bulk goods) and that the identifier is a **resolvable and verifiable ID**. Scanning a physical product QR code (or resolving its 1D barcode) should return a link type that points to the DPP described by the specification.
- DPPs may be issued at the product class level (e.g., all shoes of the same model) or at the individual item level (e.g., a specific serialised pair of shoes). `serialNumber` and/or `batchNumber` MUST be provided if the DPP is issued at the item level.
- The `productImage` is an instance of the UNTP `Link` object that provides `linkURL`, `linkName`, and `linkType` for metadata.
- `productCategory` is an array of UNTP `Classification` objects that classify the product using a global scheme such as [UN CPC](#). Industry-specific classification schemes (e.g., cattle breed) may also be used.
- `furtherInformation` is an array of UNTP `Link` types that optionally provide links to additional information, such as material safety data sheets. The `linkType` values should match those returned by an [Identity Resolver](#) service for the same product ID.
- `producedByParty` is a UNTP `Entity` type that identifies the producer or manufacturer of the product, requiring `id` and `name`.
- `producedAtFacility` is a UNTP `Entity` type that identifies the manufacturing site, farm, or mine where the product was produced, requiring `id` and `name`.
- The `dimensions` object defines the `length`, `width`, `height`, `weight`, and `volume` of the product. Implementers should choose the relevant dimensions to include for the product.
- The `productionDate` is relevant for batch or serialised items and indicates the date the specific batch or item was produced.
- The `countryOfProduction` property must carry the ISO-3166 two-letter country code for the country where the product was manufactured. This represents only the country of manufacture for the identified product; the provenance of materials used is defined separately.
- The `characteristics` property provides an extension point for commodity-specific properties, such as battery capacity in AmpHours or nutritional information for food products. UNTP does not define values for this property but provides guidance for [industry extensions](#).

```

"product": {
  "type": ["Product"],
  "id": "https://example.com/id/9520123456788",
  "name": "Baked beans, tinned, 500g.",
  "registeredId": "9520123456788",
  "idScheme": {},
  "serialNumber": "12345",
  "batchNumber": "6789",
  "productImage": {},
  "description": "Big and tender Great Northern Beans in tasty tomato sauce. These beans are rich in fiber and low in fat. Fiber rich food helps to maintain a healthier digestive system & reduces cholesterol.",
  "productCategory": [],
  "furtherInformation": [],
  "producedByParty": {},
  "producedAtFacility": {},
  "dimensions": {}
}

```

```
"productionDate": "2025-04-25",
"countryOfProduction": "AU",
"characteristics": {}
}
```

Dimensions

The `Dimension` object specifies the physical measurements of a product, including `length`, `width`, `height`, `weight`, and `volume`, each represented as a decimal value paired with a unit of measure. Units MUST be drawn from [UNECE Recommendation 20 Units of Measure](#).

```
"dimensions": {
  "length": { "value": 0.87, "unit": "MTR" },
  "width": { "value": 0.5, "unit": "MTR" },
  "height": { "value": 0.3, "unit": "MTR" },
  "weight": { "value": 8, "unit": "KGM" },
  "volume": { "value": 7.5, "unit": "LTR" }
}
```

Due Diligence Declaration

The `dueDiligenceDeclaration` property is a `Link` object that provides a URL to a due diligence declaration document, ensuring compliance with the regulations of the market into which the product is sold. Key properties of the `dueDiligenceDeclaration` include:

- The `linkURL` as a URI pointing to the due diligence declaration document.
- The `linkName` as a human-readable name describing the document.
- The `linkType` as a URI from a controlled vocabulary, indicating the type of link.

The `dueDiligenceDeclaration` SHOULD reference a document that meets the legal requirements of the importing economy.

```
"dueDiligenceDeclaration": {
  "type": ["Link"],
  "linkURL": "https://example.com/due-diligence/123456789.pdf",
  "linkName": "Due Diligence Declaration for Baked Beans",
  "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dcc"
}
```

Materials Provenance

The `materialsProvenance` property is an array of `Material` objects that describe the constituent materials in a product, detailing their key properties. Each `Material` object includes:

- A human-readable `name` for the material (e.g., "Egyptian Cotton").
- The `originCountry` as a two-letter ISO-3166 country code (e.g., "EG").

- The `materialType` as a UNTP `Classification` object, specifying the material's classification. The classification scheme depends on the product's commodity type, but typically includes the material's CAS number and a URI linking to a registry entry (e.g., <https://chem.echa.europa.eu/100.028.325>), unless otherwise specified.
- The `massFraction` as a decimal value representing the proportion of the product's total mass contributed by this material (e.g., 0.5 for 50%).
- The `mass` as a `Measure` object, specifying the absolute mass of the material with a value and unit from [UNECE Recommendation 20 Units of Measure](#).
- The `recycledMassFraction` as a decimal value indicating the proportion of this material derived from recycled sources (e.g., 0.5 for 50%).
- The `hazardous` boolean flag indicating whether the material is hazardous.
- The `materialSafetyInformation` as a `Link` object, required if `hazardous` is `true`, providing a URL to safety information (e.g., a material safety data sheet).
- The `symbol` as a base64-encoded binary string representing a visual symbol for the material, if applicable.

```
"materialsProvenance": [
  {
    "type": ["Material"],
    "name": "Egyptian Cotton",
    "originCountry": "EG",
    "materialType": {
      "type": ["Classification"],
      "id": "https://unstats.un.org/unsd/classifications/Econ/cpc/26160",
      "code": "26160",
      "name": "Cotton, carded or combed",
      "schemeID": "https://unstats.un.org/unsd/classifications/Econ/cpc/",
      "schemeName": "UN Central Product Classification (CPC)"
    },
    "massFraction": 0.5,
    "mass": {
      "value": 10,
      "unit": "KGM"
    },
    "recycledMassFraction": 0.5,
    "hazardous": false,
    "materialSafetyInformation": {},
    "symbol": "RGVtb1N5bWJvbA=="
  }
]
```

Emissions Scorecard

The `emissionsScorecard` provides a high-level summary of the product's greenhouse gas (GHG) emissions performance, expressed as a carbon footprint. Detailed emissions data, measured against specific standards or criteria, should be included in the `conformityClaim` structure. Key properties of the `emissionsScorecard` include:

- The `carbonFootprint` as a numeric value representing the GHG emissions intensity of CO₂ equivalent (CO₂e) per declared unit.
- The `declaredUnit` as a code from [UNECE Recommendation 20 Units of Measure](#), typically `KGM` (kilograms), defining the product unit for the carbon footprint calculation.

- The `operationalScope` indicating the scope 3 emissions boundary, which should be `CradleToGate` for DPPs (excluding post-sale emissions) or `CradleToGrave` for full lifecycle emissions.
- The `primarySourcedRatio` as a decimal value (0 to 1) representing the proportion of emissions data sourced directly from suppliers or product-specific measurements, rather than estimated from industry averages.
- The `reportingStandard` as a `Standard` object identifying the standard used for emissions assessment (e.g., GHG Protocol, WBSCD Pathfinder Framework), including its identifier, name, issuing party, and issue date.

```
"emissionsScorecard": {
  "type": ["EmissionsPerformance"],
  "carbonFootprint": 1.5,
  "declaredUnit": "KGM",
  "operationalScope": "CradleToGate",
  "primarySourcedRatio": 0.3,
  "reportingStandard": {
    "type": ["Standard"],
    "id": "https://www.wbcsd.org/resources/pathfinder-framework-version-2-0/",
    "name": "WBSCD Pathfinder Framework - V.2.0",
    "issuingParty": {
      "id": "https://www.wbcsd.org/",
      "name": "World Business Council for Sustainable Development"
    },
    "issueDate": "2023-12-01"
  }
}
```

Circularity Scorecard

The `circularityScorecard` provides a concise summary of the product's circularity performance, highlighting its recyclability, recycled content, and durability. Detailed circularity data and evidence should be included in one or more `Claim` objects within the `conformityClaim` structure. Key properties of the `circularityScorecard` include:

- The `recyclingInformation` as a `Link` object providing a URL to recycling instructions, primarily for recycling centers.
- The `repairInformation` as a `Link` object providing a URL to repair instructions, targeted at end users or repair service centers.
- The `recyclableContent` as a decimal value (0 to 1) indicating the proportion of the product's mass designed to be recyclable or reusable.
- The `recycledContent` as a decimal value (0 to 1) indicating the proportion of the product's mass made from recycled or repurposed materials.
- The `utilityFactor` as a numeric value representing the product's durability relative to the industry average, calculated as the product's lifetime (e.g., usage cycles) divided by the industry average (e.g., 1.2 indicates 20% greater durability).
- The `materialCircularityIndicator` as a decimal value (0 to 1) providing an overall circularity score, calculated as $1 - (V + W) / (2 * D)$, where V is the virgin material proportion ($1 - \text{recycledContent}$), W is the waste leakage proportion ($1 - \text{recyclableContent}$), and D is the `utilityFactor`. See the [Material Circularity Indicator \(MCI\) reference](#) for details.

```
"circularityScorecard": {
  "type": ["CircularityPerformance"],
  "recyclingInformation": {
    "type": ["Link"]
  }
}
```

```

    "linkURL": "https://example.com/products/123456789/recycling.pdf",
    "linkName": "Recycling Instructions",
    "linkType": "https://idr.untp.showthething.com/api/1.0.0/voc/sustainabilityInfo"
},
"repairInformation": {
    "type": ["Link"],
    "linkURL": "https://example.com/products/123456789/repair.pdf",
    "linkName": "Repair Instructions",
    "linkType": "https://idr.untp.showthething.com/api/1.0.0/voc/sustainabilityInfo"
},
"recyclableContent": 0.5,
"recycledContent": 0.3,
"utilityFactor": 1.2,
"materialCircularityIndicator": 0.67
}

```

Traceability Information

The `traceabilityInformation` property is an array of `TraceabilityPerformance` objects, each representing traceability data for a specific value chain process. These objects group traceability information by production or supply chain steps, indicating the extent of verifiable tracing for materials and components. Key properties of each `TraceabilityPerformance` object include:

- The `valueChainProcess` as a human-readable string describing the specific value chain step (e.g., "Canning").
- The `verifiedRatio` as a decimal value (0 to 1) indicating the proportion of materials or components in this step that have been verifiably traced using digital traceability events.
- The `traceabilityEvent` as an array of `SecureLink` objects, each providing a URL to a UNTP Digital Traceability Event (DTE) structure, along with metadata such as link name, type, hash digest, hash method, and encryption method (if applicable). These links reference events like transformations or shipments, as defined in [Digital Traceability Events](#).

Each value chain step SHOULD specify the `verifiedRatio` to reflect the traceability coverage, and MAY include `traceabilityEvent` links to provide evidence of traceability.

```

"traceabilityInformation": [
{
    "type": ["TraceabilityPerformance"],
    "valueChainProcess": "Canning",
    "verifiedRatio": 0.5,
    "traceabilityEvent": [
        {
            "type": ["SecureLink", "Link"],
            "linkURL": "https://example.com/events/123456789.json",
            "linkName": "Canning Process Event",
            "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dte",
            "hashDigest": "50af99a26f4af48c9f4ad8cf9d2f5018780ab4bb1167f0e94884ec228f1ba832",
            "hashMethod": "SHA-256",
            "encryptionMethod": "AES"
        }
    ]
}
]

```

Conformity Information

A key idea in UNTP is that performance **claims** made in product passports and facility records SHOULD reference well defined criteria from a recognised scheme, standard, or regulation. Also that performance **assessments** made in conformity credentials MUST also reference well defined criteria. In this way, claims and assessments have unambiguous meaning as defined by the relevant scheme, standard or regulation. The `conformityClaim` structure of a DPP is described below.

- The `id` as a globally unique identifier, either a UUID or a URI within the DPP issuer's domain.
- The `description` as a human-readable explanation of the claim's purpose or scope (e.g., summarizing the emissions assessment for battery production).
- The `referenceStandard` as a UNTP `Standard` object identifying the standard against which the claim is made.
- The `referenceRegulation` as a UNTP `Regulation` object identifying the regulation against which the claim is made. Typically, a claim references either a `Standard` or a `Regulation`, but both may apply in some cases.
- The `assessmentCriteria` as an array of UNTP `Criterion` objects specifying the rules within the standard or regulation against which the claim is evaluated.
- The `declaredValue` as an array of UNTP `Metric` objects defining the product's actual measured values, optionally including accuracy. If sensitive, this may be replaced by a `conformance` assertion.
- The `conformance` as a boolean indicating whether the product meets the specified criteria.
- The `conformityTopic` as a code from a UNTP classification scheme, categorizing the claim (e.g., environmental sustainability).
- The `assessmentDate` as a date when the claim was assessed.
- The `conformityEvidence` as a `SecureLink` object providing a URL to a second or third party attestation, such as a UNTP [Digital Conformity Credential](#), PDF, or other evidence format.

```
"conformityClaim": [
  {
    "type": ["Claim", "Declaration"],
    "id": "https://example.com/declarations/90664869327",
    "description": "Declaration of greenhouse gas emissions intensity for battery production, conforming to the GBA Rulebook V.2.0.",
    "referenceStandard": {
      "type": ["Standard"],
      "id": "https://www.globalbattery.org/media/publications/gba-rulebook-v2.0-master.pdf",
      "name": "GBA Battery Passport Greenhouse Gas Rulebook - V.2.0",
      "issuingParty": {
        "id": "https://www.globalbattery.org/",
        "name": "Global Battery Alliance"
      },
      "issueDate": "2023-12-01"
    },
    "assessmentCriteria": [
      {
        "type": ["Criterion"],
        "id": "https://www.globalbattery.org/GHGRulebook/2.0/GHG_Calculation",
        "name": "GHG Calculation",
        "description": "Calculation of greenhouse gas emissions for product packaging process",
        "conformityTopic": "environment.emissions",
        "status": "active"
      }
    ],
  }
]
```

```

"declaredValue": [
  {
    "type": ["Metric"],
    "metricName": "GHG Emissions Intensity",
    "metricValue": {
      "type": ["Measure"],
      "value": 1.5,
      "unit": "KGM"
    },
    "accuracy": 0.05
  },
  ],
  "conformance": true,
  "conformityTopic": "environment.emissions",
  "assessmentDate": "2024-03-15",
  "conformityEvidence": {
    "type": ["SecureLink", "Link"],
    "linkURL": "https://example.com/certificates/1234567.json",
    "linkName": "GBA Rulebook Conformity Certificate",
    "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dcc",
    "hashDigest": "6239119dda5bd4c8a6ffb832fe16feaa5c27b7dba154d24c53d4470a2c69adc2",
    "hashMethod": "SHA-256",
    "encryptionMethod": "none"
  }
},
]

```

Referencing Conformity Criterion

Conformity **claims** in DPPs SHOULD unambiguously reference a **criterion** in a relevant scheme, standard, or regulation using a URI. For example the `"id": "https://www.globalbattery.org/GHGRulebook/2.0/GHG_Calculation"` property in the example above is an example of a URI that references which rulebook an emissions intensity claim is made. Issuers of Digital product Passports (and Facility Records and Conformity Credentials) therefore need a way to find the the right criterion URI to put in their claims and assessments. This is the purpose of the UNTP [Sustainability Vocabulary Catalog](#).

Conformity Credential

! INFO

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artifacts

Are maintained at <https://test.uncefact.org/vocabulary/untp/dcc/0/about>

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due in June 2025 after formal public review

Release for Pilot Testing

Digital Conformity Credential version 0.6.0 release artifacts can be used for pilot testing.

- [JSON-LD @context](#)
- [JSON Schema](#)
- [Sample Instance](#)

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

Ontology

The ontology for the Digital Conformity Credential is available in JSON-LD format and can be retrieved via content negotiation from:

<https://test.uncefact.org/vocabulary/untp/dcc/0/>

Example:

```
curl https://test.uncefact.org/vocabulary/untp/dcc/0/ -H 'Accept: application/ld+json'
```

Version History

History of releases is available from the [Version history](#) page.

Default Render Template

A UNTP digital product passport may be rendered in any format desired by the issuer. However a default [Template Design](#) is provided here and includes mapping of visual rendering elements to the [Logical Data Model](#).

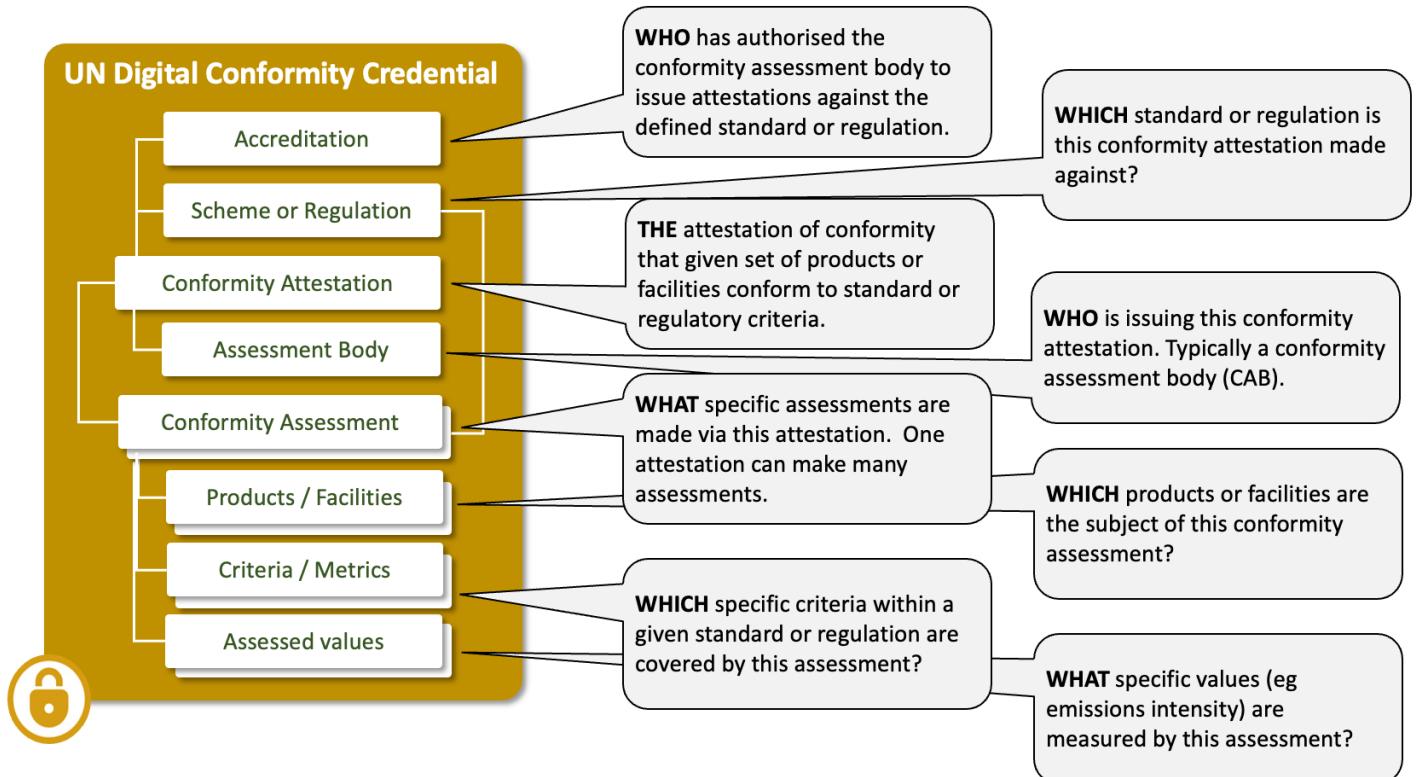
Sample Credential

URL	QR	Description
Sample Battery Performance and Safety Certificate		A sample digital conformity credential as a JWT envelope signed Verifiable Credential. The URL (or QR scan) resolved to a hosted verifier that displays a human readable version. Raw JSON data can be viewed via the JSON tab and the full credential can be downloaded via the download button.

Overview

Conformity credentials are usually issued by independent parties and provide a **trusted assessment** of product ESG performance against credible **standards or regulations**. As such the credential provides trusted verification of the ESG claims in the passport. Since the passport may make several independent claims (eg emissions intensity, deforestation free, fair work, etc) there may be many linked conformity credentials referenced by one passport. As an additional trust layer, the conformity credential may reference an **accreditation** credential that attests to the authority of the party to perform the specific ESG assessments. The conformity credential data model has been developed by a separate UN/CEFACT project on digital conformity that has expert membership from accreditation authorities and conformity assessment bodies.

Conceptual Model



Requirements

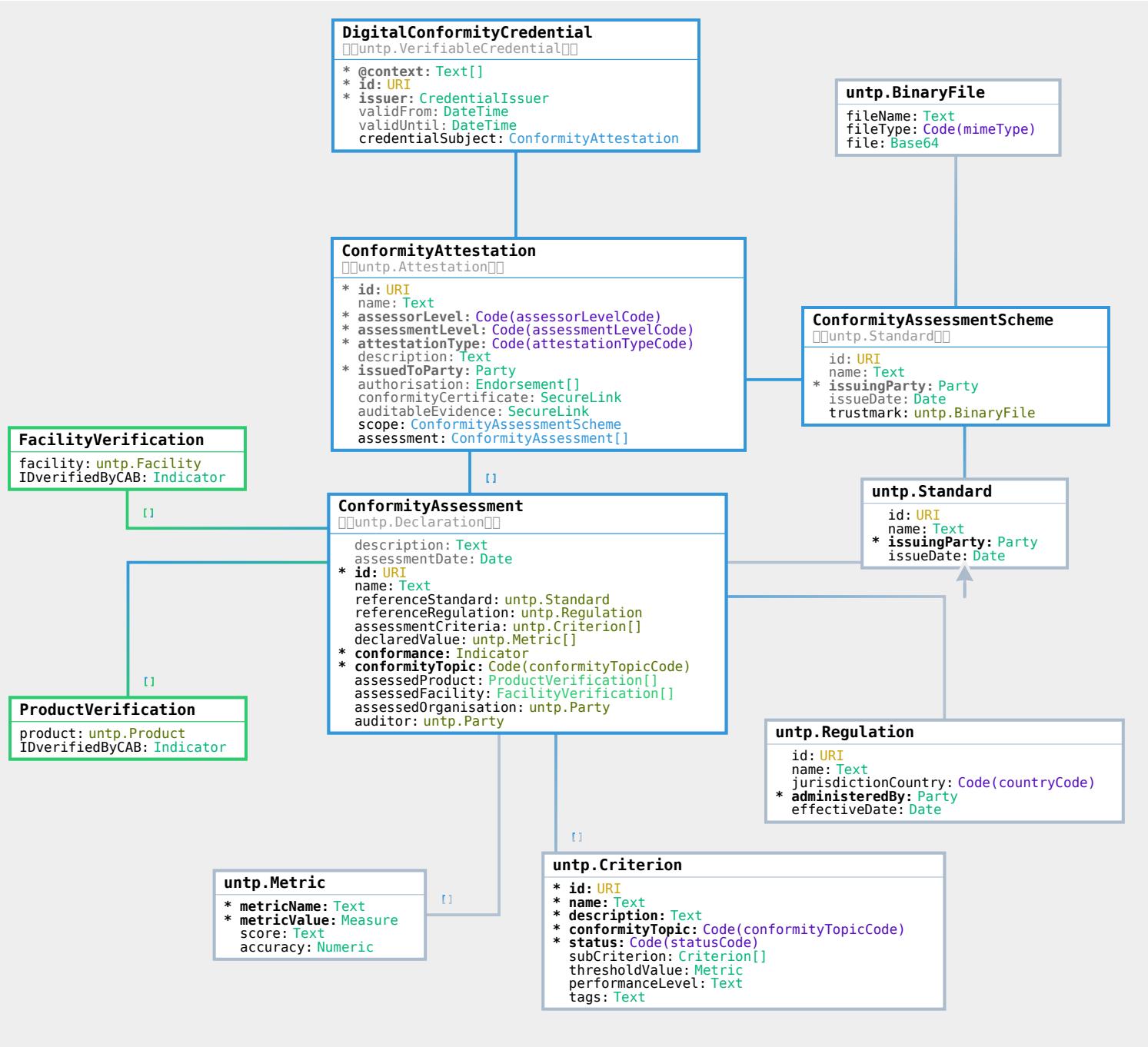
The digital conformity credential (DCC) is designed to meet the following detailed requirements as well as the more general [UNTP Requirements](#).

ID	Name	Requirement Statement	Solution Mapping
DCC-01	Authorised	The DCC MUST be verifiable as issued by an authorised body, typically a conformity assessment body (CAB)	DCC MUST be issued as a digital verifiable credential signed by the CAB
DCC-02	Assurance level	The DCC MUST identify the nature of any authority or support for attestation, such as formal recognition by a Governmental authority or an Accreditation Body	Attestation.authorisation property
DCC-03	Object of conformity	The DCC MUST unambiguously identify the object of the conformity assessment, whether a product, facility or organisation.	ConformityAssessment.assessedProduct, ConformityAssessment.assessedFacility, ConformityAssessment.assessedOrganisation

ID	Name	Requirement Statement	Solution Mapping
DCC-04	Reference standard or regulation	The DCC MUST identify the reference standard(s) and/or regulation(s) that specify the criteria against which the conformity assessment is made. If appropriate this must include specific measurable thresholds (eg minimum tensile strength)	ConformityAssessment.referenceStandard, ConformityAssessment.referenceRegulation, ConformityAssessment.assessmentCriteria
DCC-05	Conformity Attestation	The DCC MUST unambiguously state whether or not the object of the assessment is conformant to the reference standard or regulation criteria	ConformityAssessment.conformance
DCC-06	Measured metrics	The DCC SHOULD include actual measured values (eg emissions intensity, tensile strength, etc) with the conformity assessment	ConformityAssessment.declaredValue
DCC-07	Evidence	The DCC MAY include references to audit-able evidence (eg instrument recordings, satellite images, etc) to support the assessment. If so then the hash of the evidence file-set SHOULD be included (so that an auditor can be sure that the evidence data has not changed). The evidence data MAY be encrypted with decryption keys provided on request	Attestation.auditEvidence

Logical Model

The Digital Conformity Credential is an assembly of re-usable components from the UNTP core vocabulary.



Core Vocabulary

The [UNTP core types vocabulary](#) defines the uniquely identified Linked Data entities such as Product, Location, Party, Standard, Regulation, Criteria, Declaration, Attestation, Endorsement. These entities provide the building blocks for construction of Digital Product Passports and Digital Conformity Credentials.

DCC Documentation

The [DCC class & property definitions](#) provide a technology-neutral definition of classes, properties and code lists in the DCC model.

Implementation Guidance

Verifiable Credential

Digital Conformity Credentials are issued as W3C Verifiable Credentials. Please refer to [DPP VC Guidance](#) for information about the use of the verifiable credentials data model for UNTP.

Conformity Attestation

The `ConformityAttestation` type is the root content of the `credentialSubject` of the DCC. It is best thought of as the digital version of the paper product or facility conformity certificate.

- The `type` property is mandatory and must be populated with the value `ConformityAttestation, Attestation` indicating the JSON-LD type of the data.
- The `id` MUST be a globally unique identifier (URI) for the attestation. Typically a certificate number with the CAB web domain as a prefix.
- The `name` property should contain a human readable text string that describes the attestation.
- `assessorLevel` (how assured is the party doing the assessment?), `assessmentLevel` ("how assured is the process by which the object product/facility is being assessed?) and `attestationType` (is this a test report, a certificate, or some other type?) are coded values that help to classify the type and integrity of the attestation.
- `description` is a human-readable explanation of the attestation being made.
- `issuedToParty` identifies the entity to who the conformity attestation is issued - usually the product manufacturer or facility operator.
- `authorisation` describes a list of accreditations that a competent authority (such as a government agency or a national accreditation authority or a trusted global standards body) has issued to the conformity assessment body that is issuing this attestation. It provides trust that the certifier is properly accredited to issue certificates.
- `conformityCertificate` is a secure link to the full version (eg a PDF document) of this attestation.
- `auditableEvidence` is a secure link to an unstructured collection of files which provided the original evidence basis for the conformity assessments made by this DCC. The evidence files are usually commercially sensitive and encrypted but are an important information source for audits.
- `scope` defines the conformity scheme under which this attestation is issued. A scheme is a high level framework describing the context for the entire attestation. Each individual assessment included in this attestation will usually reference more fine grained criteria within any standards or regulations that are part of the scheme.
- `assessment` is an array of detailed conformity assessments made about an identified product or facility - against a specific criteria contained in a standard or regulation.

```
"credentialSubject": {  
  "type": ["ConformityAttestation", "Attestation"],  
  "id": "https://exampleCAB.com/38f73303-a39e-45a7-b8b7-e73517548f27",  
  "name": "Carbon Lifecycle assessment 12345567",  
  "assessorLevel": "3rdParty",  
  "assessmentLevel": "Accredited",  
  "attestationType": "certification",  
  "description": "Assessment of battery products against the GHG Protocol.",  
  "issuedToParty": {...},
```

```
"authorisation": [...],
"conformityCertificate": [...],
"auditabileEvidence": [...],
"scope": [...],
"assessment": [...]
}
```

Authorisations (Endorsements)

Authorisations are endorsements or accreditations issued by a competent authority (such as a government agency or a national accreditation authority or a trusted global standards body) has issued to the conformity assessment body that is issuing this attestation. It provides trust that the certifier is properly accredited to issue certificates.

- The `id` is a URI providing a unique ID of the endorsement / accreditation.
- The `name` is the name of the accreditation.
- `trustmark` is a base64 binary file that is typically shown on paper accreditations or endorsements.
- The `issuingAuthority` object defines the identity details of the competent authority that issued the endorsement. For example, in Australia the accreditation authority for conformity test labs is [NATA](#).
- `endorsementEvidence` is a link to the actual accreditation details. This link SHOULD point to a trusted source of evidence such as a web page on the accreditation authority site ([example](#)) or a digital verifiable credential.

It should be noted that this `authorisations` structure is part of the attestation issued by the conformity assessment body. As such it is only an unverified claim until confirmed via the `endorsementEvidence` link.

```
"authorisation": [
{
  "type": [
    "Endorsement"
  ],
  "id": "https://authority.gov/schemeABC/123456789",
  "name": "Accreditation of certifiers.com under the Australian National Greenhouse and Energy Reporting scheme (NGER).",
  "trustmark": {
    "fileName": "NGER Accreditation",
    "fileType": "image/png",
    "file": "iVBORw0KGgoAAAANSUhEUgAAADkAAAA2CAYAAAB9TjFQAAAABGdBTUEAAi/9H3pWy6vI9uFdAAAAAE1FTkSuQmCC"
  },
  "issuingAuthority": {
    "id": "https://abr.business.gov.au/ABN/View?abn=72321984210",
    "name": "Clean Energy Regulator",
    "registeredId": "72321984210",
    "idScheme": {
      "type": [
        "IdentifierScheme"
      ],
      "id": "https://business.gov.au/ABN/",
      "name": "Australian Business Number"
    }
  },
  "endorsementEvidence": {
    "linkURL": "https://files.example-authority.com/1234567.json",
    "evidence": [
      {
        "type": "Image"
      }
    ]
  }
}
```

```

        "linkName": "NGER conformity certificate",
        "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dcc"
    }
}
]
```

Conformity Certificate and Auditable Evidence (Secure Link)

The `conformityCertificate` and `auditableEvidence` objects are both the same `SecureLink` type. The purpose is to provide a verifiable link to further details about the attestation (the certificate) or the auditable evidence (eg test results) that informed the attestation.

- `linkURL` points to the external certificate or evidence described by `linkName`.
- `linkType` is an optional identifier that, if present, should be drawn from a controlled vocabulary of link types ([example](#)).
- `hashDigest` should equal the hash of the target. This provides an integrity measure to ensure that the external certificate or evidence has not been tampered since the DCC was issued.
- `hashMethod` code defines which hash algorithm to use.
- `encryptionMethod` defines whether the target is encrypted and, if so, using which algorithm. This provides a privacy/confidentiality mechanism to protect more sensitive content. The decryption key is assumed to be passed out of bounds.

```

"conformityCertificate": {
    "linkURL": "https://files.example-certifier.com/1234567.json",
    "linkName": "GBA rule book conformity certificate",
    "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dcc",
    "hashDigest": "7d294dd556fc7c5c7ee1123fb18a59686b74e9697fee2299906e00f80ec1dc8",
    "hashMethod": "SHA-256",
    "encryptionMethod": "AES"
},
"auditableEvidence": {
    "linkURL": "https://files.example-certifier.com/1234567.json",
    "linkName": "GBA rule book conformity certificate",
    "linkType": "https://test.uncefact.org/vocabulary/linkTypes/dcc",
    "hashDigest": "73af1e7404283545909e9714e51e4b1653ff168ecfbe69dddcf4feece01e0c87",
    "hashMethod": "SHA-256",
    "encryptionMethod": "AES"
},
```

Scope (Conformity Assessment Scheme)

`scope` defines the conformity scheme under which this attestation is issued. A scheme is a high level framework describing the context for the entire attestation. many individual assessments can be made under one scheme, and each may reference different standards or regulations.

- the `id` and `name` identifies the scheme. `issuingParty` identifies the scheme owner.
- the `issueDate` defines when the scheme was created and the `trustMark` is a binary file representing the mark or logo of the scheme.

```

"scope": {
  "type": [
    "ConformityAssessmentScheme",
    "Standard"
  ],
  "id": "https://www.globalbattery.org/media/publications/gba-rulebook-v2.0-master.pdf",
  "name": "GBA Battery Passport Greenhouse Gas Rulebook - V.2.0",
  "issuingParty": {
    "id": "https://kbopub.economie.fgov.be/kbopub/toonondernemingsps.html?ondernemingsnummer=786222414",
    "name": "Global Battery Alliance",
    "registeredId": "786222414",
    "idScheme": {
      "type": [
        "IdentifierScheme"
      ],
      "id": "https://kbopub.economie.fgov.be/",
      "name": "Belgian business register"
    }
  },
  "issueDate": "2023-12-05",
  "trustmark": {
    "fileName": "GHG protocol trust mark",
    "fileType": "image/png",
    "file": "iVBORw0KGgoAAAANSUhEUgAAADkAAAA2CAYAAAB9TjFQAAAABGdBTUEAAi/9H3pWy6vI9uFdAAAAAE1FTkSuQmCC"
  }
}

```

Assessment (Conformity Assessment)

One conformity credential may include many assessments. Each assessment includes:

- a unique `id` and human-readable `name` for the assessment
- a textual `description` of the assessment's purpose or scope
- subjects of the assessment (ie what was assessed) which may reference one or more products, facilities, or organisations. For example a 300Ah Lithium battery.
- a reference standard and/or regulation against which the assessment was made. For example the global battery alliance rulebook.
- one or more specific criteria within the referenced standard or regulation which may include benchmark or threshold values. For example the industry benchmark carbon intensity of lithium batteries
- one or more actual declared values. For example the actual carbon intensity of the assessed battery.
- an indicator of `conformance` against the regulation or standard. For example, the battery conforms to the GBA rulebook.
- a category classifying the assessment's sustainability or compliance focus. e.g. environment.emissions
- the date when the assessment was conducted
- the ID and name of the auditor if different to the issuer of the conformity credential.

```

"assessment": [
  {

```

```
"type": [
    "ConformityAssessment",
    "Declaration"
],
"assessmentDate": "2024-03-15",
"id": "https://exampleCAB.com/38f73303-a39e-45a7-b8b7-e73517548f27/01",
"name": "GHG Emissions Intensity Assessment",
"description": "A standardised disclosure of the battery's greenhouse gas emissions intensity, calculated in accordance with the Global Battery Alliance Battery Passport Greenhouse Gas Rulebook V.2.0.",
"referenceStandard": {
    "type": [
        "Standard"
    ],
    "id": "https://www.globalbattery.org/media/publications/gba-rulebook-v2.0-master.pdf",
    "name": "GBA Battery Passport Greenhouse Gas Rulebook - V.2.0",
    "issuingParty": {...},
    "issueDate": "2023-12-05"
},
"referenceRegulation": {...},
"assessmentCriteria": [
    {
        "type": [
            "Criterion"
        ],
        "id": "https://www.globalbattery.org/media/publications/gba-rulebook-v2.0-master.pdf#GHGEmissions",
        "name": "GBA GHG Emissions Intensity Calculation",
        "description": "Calculation of greenhouse gas emissions intensity for battery production, expressed in kg CO2e per kWh.",
        "conformityTopic": "environment.emissions",
        "status": "active",
        "subCriterion": [],
        "thresholdValue": {
            "metricName": "GHG emissions intensity",
            "metricValue": {
                "value": 10,
                "unit": "KGM"
            },
            "score": "BB",
            "accuracy": 0.05
        },
        "performanceLevel": "\"Category 3 recyclable with 73% recyclability\"",
        "tags": ""
    }
],
"declaredValue": [
    {
        "metricName": "GHG emissions intensity",
        "metricValue": {
            "value": 10,
            "unit": "KGM"
        },
        "score": "BB",
        "accuracy": 0.05
    }
],
"conformance": true,
"conformityTopic": "environment.emissions",
"assessedProduct": [
```

```
{
  "product": {
    "id": "https://example.com/id/9520123456788",
    "name": "EV battery 300Ah",
    "registeredId": "9520123456788",
    "serialNumber": "12345"
  },
  "IDverifiedByCAB": true
},
],
"assessedFacility": [...],
"assessedOrganisation": {...},
"auditor": {...}
}
]
```

To help understand the difference between a **Scheme** that defines the scope of the overall attestation and the **Criterion** that defines the rules for a specific conformity assessment, an example can help.

- ACRS operates a structural steel **product certification scheme** which will include a specific assessment assessment criteria for many different steel product types. For example on criteria could be about minimum tensile strength of a concrete reinforcing steel bar under criteria define by standard **AS/NZS 4671: 2019**.

Sample

Digital Traceability Events

!(Info)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artifacts

Are maintained at <https://test.uncefact.org/vocabulary/untp/dte/0/about>

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due in June 2025 after formal public review

Release for Pilot Testing

Version 0.6.0 release artifacts can be used for pilot testing.

- [JSON-LD @context](#)
- [JSON Schema](#)
- [Sample Instance](#)

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

Ontology

The ontology for Digital Traceability Events is available in JSON-LD format and can be retrieved via content negotiation from:

<https://test.uncefact.org/vocabulary/untp/dte/0/>

Example:

```
curl https://test.uncefact.org/vocabulary/untp/dte/0/ -H 'Accept: application/ld+json'
```

Version History

History of releases is available from the [Version history](#) page.

Visualization

A UNTP digital traceability event may be rendered in any format desired by the issuer. However a default [Visualization](#) is provided here and includes mapping of visual rendering elements to the [Logical Data Model](#).

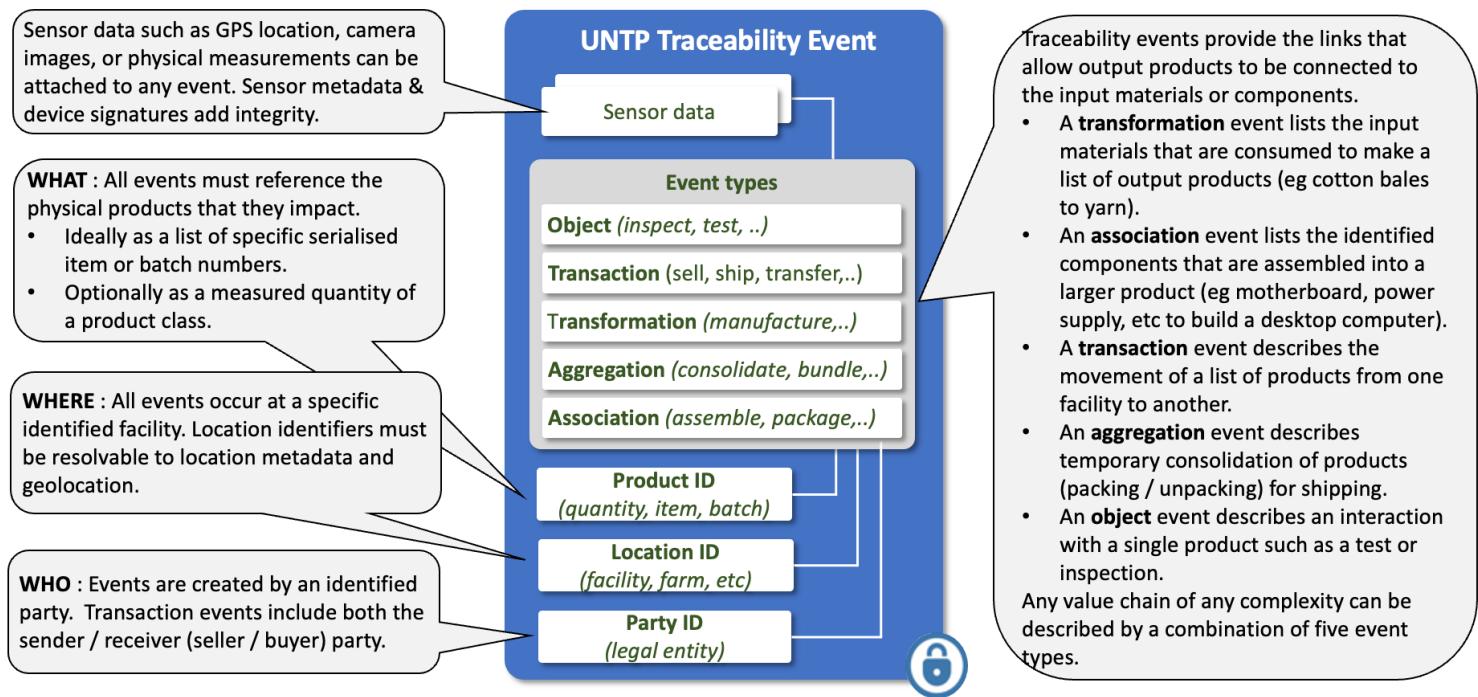
Sample Credential

URL	QR	Description
Sample Battery Transformation Event		A sample digital traceability event (transformation) as a JWT envelope signed Verifiable Credential. The URL (or QR scan) resolved to a hosted verifier that displays a human readable version. Raw JSON data can be viewed via the JSON tab and the full credential can be downloaded via the download button.

Overview

Traceability events are very lightweights collections of identifiers that specify the “what, when, where, why and how” of the products and facilities that constitute a value chain. The UNTP leverages ISO/IEC 19987 standard for this purpose because it is an existing and proven mechanism for supply chain traceability. The basic idea behind the traceability event structure is that any supply chain of any complexity can always be accurately modeled using a combination of four basic event types. An **object** event describes an action on specific product(s) such as an inspection. A **transaction** event describes the exchange of product(s) between two actors such as sale of goods between seller and buyer. An **aggregation** event describes the consolidation or de-consolidation of products such as stacking bales of cotton on a pallet for transportation. An **association** event describes the assembly of sub-components to make a composite product. Finally, a **transformation** event describes a manufacturing process that consumes input product(s) to create new output product(s). The UNTP uses these events in a decentralised architecture as the means to traverse the linked-data “graph” that represents the entire value-chain.

Conceptual Model



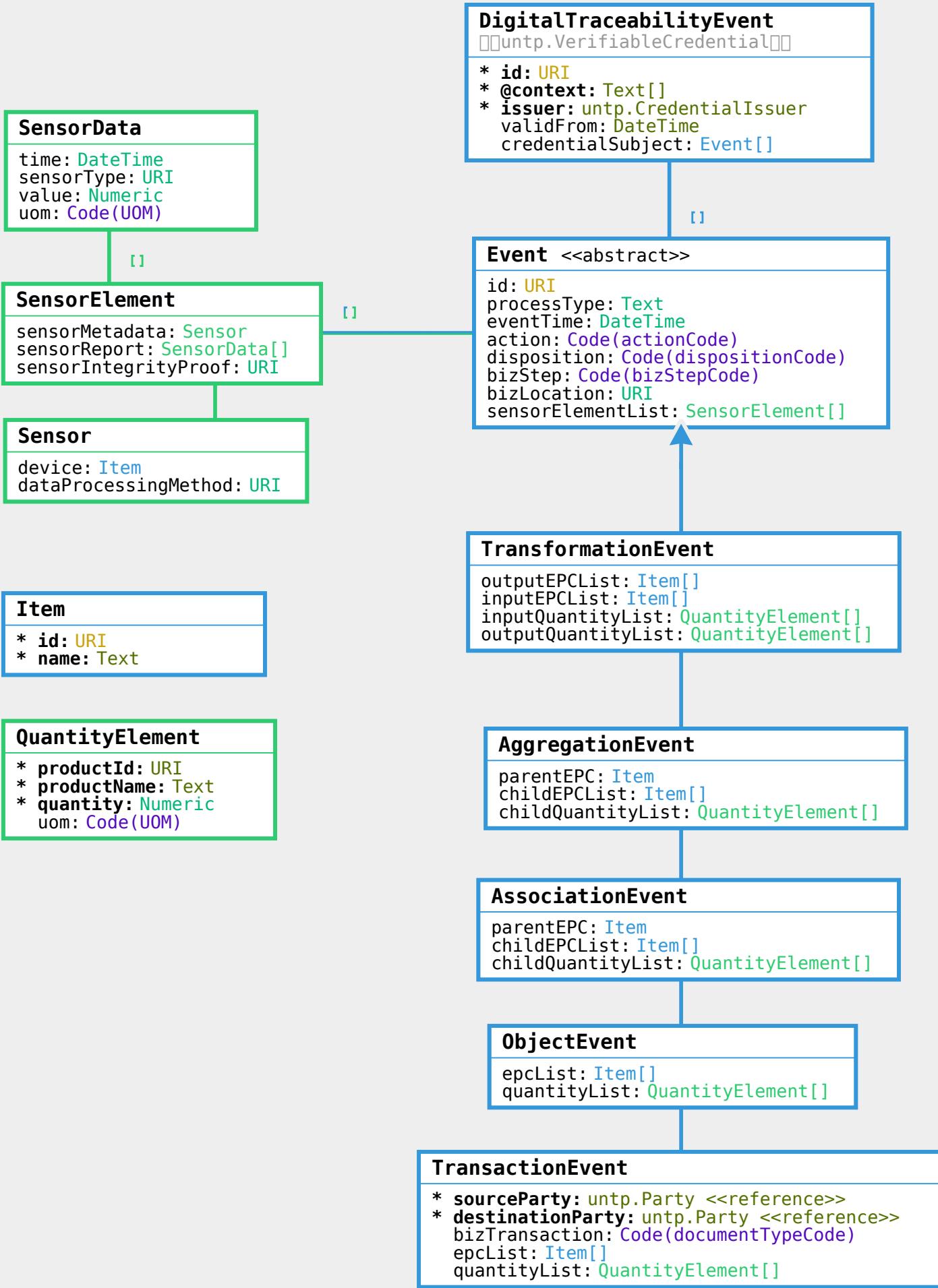
Requirements

The traceability event is designed to meet the following detailed requirements as well as the more general [UNTP Requirements](#)

ID	Name	Requirement Statement	Solution Mapping
TEV-01	Sub-components	The traceability event MUST provide a mechanism to trace from a DPP representing a product assembly to the individual DPPs of each sub-assembly component part	Association Event
TEV-02	Consumed materials	The traceability event MUST provide a mechanism to trace a manufactured product DPP back to the DPPs representing batches of input materials that are consumed in manufacturing one or more output products.	Transformation Event
TEV-03	Aggregated bundles	When a DPP represents an aggregated bundle of similar items (eg a pallet of cotton bales) then the traceability event MUST provide a means to allocate the aggregate measures to each individual item (ie each bale)	Aggregation Event
TEV-04	Transportation	when a product (or consolidated consignment) is shipped from one physical location to another, the traceability event MUST provide a means to record the movement and associate sustainability measures such as transport emissions to the shipped bundle	Transaction event

ID	Name	Requirement Statement	Solution Mapping
TEV-05	items or quantities	Traceability events MUST work equally well whether the input or output items are individually serialised items or measured quantities (mass or volume) of a product class.	Items Quantity
TEV-06	IoT Sensor data	Traceability events will often be generated by or associated with physical sensor readings. In such cases, the traceability event SHOULD support the association of sensor data with the event	Sensor element
TEV-07	Time & Location	Traceability events MUST always record the timestamp and physical location of the event so that multiple events can be connected in time and space	Event

Logical Model



Core Vocabulary Documentation

The [UNTP core types vocabulary](#) defines the uniquely identified Linked Data entities such as Product, Location, Facility, Party, Standard, Regulation, Criteria, Declaration, Attestation, Endorsement. These entities provide the building blocks for construction of Digital Product Passports and Digital Conformity Credentials.

DTE Documentation

The [UNTP Digital Traceability Events Vocabulary](#) defines the core traceability event and its variants including aggregation event, transformation event, association event, transaction event, and object event.

Implementation Guidance

Verifiable Credential

Digital Traceability Events are issued as W3C Verifiable Credentials. Note that one UNTP Digital Traceability Event credential may contain multiple events.

Please refer to [DPP VC Guidance](#) for information about the use of the verifiable credentials data model for UNTP.

Traceability Event

There are five types of traceability event which all extend the same abstract `Event` model.

- A `TransformationEvent` describes manufacturing processes where input materials are consumed and/or assembled to create new output products. For example cotton thread is consumed to make woven cotton fabric.
- An `AssociationEvent` is used to establish relationships between otherwise independent items. For example new tyres on a car.
- An `AggregationEvent` describes the grouping (or un-grouping) of a quantity of similar items, usually for transport. For example the stacking of several bales of cotton onto a pallet.
- A `TransactionEvent` represents the transfer of products between organisations or facilities. For example the sale of some cotton cloth from seller to buyer.
- An `ObjectEvent` represents an action on an individual item or quantity of product. For example an inspection or test of a battery.

Any value chain of any complexity can be represented as a combination of these types of events. However for UNTP value chain traceability, the most important event is the transformation event because it represents a manufacturing step that consumes inputs to create new outputs. When an identified output product (with its digital product passport) can be traced to its identified input products (each with their own digital product passport) then a linked set of credentials can be followed to define an entire value chain.

Transformation Event

This transformation event example describes the manufacture of a battery cell (output EPC) from an anode and a cathode (input EPC list) and a quantity of electrolyte (input quantity list).

```
"credentialSubject": [
  {
    "type": [
      "TransformationEvent",
      "Event"
    ],
    "id": "https://events.sample.com/b681df10-c682-454a-b11b-d0b9374c01bd",
    "processType": "Cell Manufacture",
    "eventTime": "2024-09-01T12:00:00Z",
    "action": "add",
    "disposition": "active",
    "bizStep": "commissioning",
    "bizLocation": "https://plus.codes/8CGRC78W+MM",
    "sensorElementList": [...],
    "outputEPCList": [
      {
        "type": [
          "Item"
        ],
        "id": "https://id.sample.org/01/09520123456788/21/12345",
        "name": "EV battery 300Ah."
      }
    ],
    "inputEPCList": [
      {
        "type": [
          "Item"
        ],
        "id": "https://id.sample.org/01/09520123456788/21/99876",
        "name": "Graphite Anode"
      },
      {
        "type": [
          "Item"
        ],
        "id": "https://id.sample.org/01/09520123456788/21/99987",
        "name": "Copper Cathode"
      }
    ],
    "inputQuantityList": [
      {
        "productId": "https://id.sample.org/01/095201299876",
        "productName": "Lithium electrolyte",
        "quantity": 2,
        "uom": "KGM"
      }
    ],
    "outputQuantityList": [...]
  }
]
```

Association Event

This association event example describes the replacement of a new battery cell (child EPC) in an electric vehicle (parent EPC).

```
"credentialSubject": [
  {
    "type": [
      "AssociationEvent",
      "Event"
    ],
    "id": "https://events.sample.com/b681df10-c682-454a-b11b-d0b9374c01bd",
    "processType": "Replace battery",
    "eventTime": "2024-09-01T12:00:00Z",
    "action": "add",
    "disposition": "active",
    "bizStep": "commissioning",
    "bizLocation": "https://plus.codes/8CGRC78W+MM",
    "sensorElementList": [...],
    "parentEPC": {
      "type": [
        "Item"
      ],
      "id": "https://sample-car-company/VIN-Number/12345678987654",
      "name": "My Electric car."
    },
    "childEPCs": [
      {
        "type": [
          "Item"
        ],
        "id": "https://id.sample.org/01/09520123456788/21/12345",
        "name": "EV battery 3000Ah."
      }
    ],
    "childQuantityList": [...]
  }
]
```

Aggregation Event

This aggregation event describes the packaging for shipment of two battery cells (child EPCs) into a battery consignment (parent EPC)

```
"credentialSubject": [
  {
    "type": [
      "AggregationEvent",
      "Event"
    ],
    "id": "https://events.sample.com/b681df10-c682-454a-b11b-d0b9374c01bd",
    "processType": "Packing",
    "eventTime": "2024-09-01T12:00:00Z",
    "action": "add",
    "disposition": "active",
```

```

"bizStep": "commissioning",
"bizLocation": "https://id.sample.org/414/9520123456788",
"sensorElementList": [...],
"parentEPC": {
  "type": [
    "Item"
  ],
  "id": "https://consignments.com/1234567890",
  "name": "shipment of batteries"
},
"childEPCs": [
  {
    "type": [
      "Item"
    ],
    "id": "https://id.sample.org/01/09520123456788/21/12345",
    "name": "EV battery 300Ah."
  },
  {
    "type": [
      "Item"
    ],
    "id": "https://id.sample.org/01/09520123456788/21/678910",
    "name": "EV battery 300Ah."
  }
],
"childQuantityList": [...]
}
]

```

Transaction Event

This transaction event describes the sale of 200 batteries (quantity list) from source party to destination party.

```

"credentialSubject": [
{
  "type": [
    "TransactionEvent",
    "Event"
  ],
  "id": "https://events.sample.com/b681df10-c682-454a-b11b-d0b9374c01bd",
  "processType": "Shipping",
  "eventTime": "2024-09-01T12:00:00Z",
  "action": "add",
  "disposition": "active",
  "bizStep": "commissioning",
  "bizLocation": "https://plus.codes/8CGRC78W+MM",
  "sensorElementList": [...],
  "sourceParty": "https://somebusinessregister/ID/9988765443",
  "destinationParty": "https://abr.business.gov.au/ABN/View?abn=90664869327",
  "bizTransaction": "prodorder",
  "epcList": [...],
  "quantityList": [
    {
      "productId": "https://id.sample.org/01/09520123456788",
      "productName": "EV battery 300Ah."
    }
  ]
}
]

```

```
        "quantity": 200,
        "uom": "KGM"
    }
]
}
]
```

Object Event

This object event describes the repair of a battery cell (EPC list).

```
"credentialSubject": [
{
  "type": [
    "ObjectEvent",
    "Event"
  ],
  "id": "https://events.sample.com/b681df10-c682-454a-b11b-d0b9374c01bd",
  "processType": "Repair",
  "eventTime": "2024-09-01T12:00:00Z",
  "action": "add",
  "disposition": "active",
  "bizStep": "commissioning",
  "bizLocation": "https://id.sample.org/414/9520123456788",
  "sensorElementList": [...],
  "epcList": [
    {
      "type": [
        "Item"
      ],
      "id": "https://id.sample.org/01/09520123456788/21/12345",
      "name": "EV battery 300Ah."
    }
  ],
  "quantityList": [...]
}]
```

Item

The item structure is designed to represent serialised items such as a specific battery cell.

```
"outputEPCList": [
{
  "type": [
    "Item"
  ],
  "id": "https://id.sample.org/01/09520123456788/21/12345",
  "name": "EV battery 300Ah."
}]
```

Quantity Element

The quantity element structure is designed to represent a measured quantity such as 20kgs of lithium hydroxide.

```
"inputQuantityList": [
  {
    "productId": "https://sampleRegister.com/material/876544321",
    "productName": "Lithium hydroxide",
    "quantity": 20,
    "uom": "KGM"
  }
]
```

Sensor Element

The sensor element structure accommodates the association of one or more sensor readings to a given event. Each reading is measured by an identified sensor.

```
"sensorElementList": [
  {
    "sensorMetadata": {
      "device": {
        "type": [
          "Item"
        ],
        "id": "https://sampledeviceregister.com/123456",
        "name": "Temperature sensor",
      },
      "dataProcessingMethod": "https://standards.org/sensorMethod#1234"
    },
    "sensorReport": [
      {
        "time": "2024-07-24T12:00:00Z",
        "sensorType": "https://samplesensors.com/model1234",
        "value": 25,
        "uom": "KGM"
      },
      {
        "time": "2024-07-24T12:00:00",
        "sensorType": "https://samplesensors.com/model1234",
        "value": 25,
        "uom": "KGM"
      }
    ],
    "sensorIntegrityProof": "..."
  }
]
```

Digital Facility Record

!(Info)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artifacts

Are maintained at <https://test.uncefact.org/vocabulary/untp/dfr/0/about>

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due in June 2025 after formal public review

Release for Pilot Testing

Version 0.6.0 release artifacts can be used for pilot testing.

- [JSON-LD @context](#)
- [JSON Schema](#)
- [Sample Instance](#)

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

Ontology

The ontology for the Digital Facility Record is available in JSON-LD format and can be retrieved via content negotiation from:

<https://test.uncefact.org/vocabulary/untp/dfr/0/>

Example:

```
curl https://test.uncefact.org/vocabulary/untp/dfr/0/ -H 'Accept: application/ld+json'
```

Version History

History of releases is available from the [Version history](#) page.

Default Render Template

A UNTP digital facility record may be rendered in any format desired by the issuer. However a default [Template Design](#) is provided here and includes mapping of visual rendering elements to the [Logical Data Model](#).

Sample Credential

URL	QR	Description
Sample Battery Manufacturing Facility Record		A sample digital facility record as a JWT envelope signed Verifiable Credential. The URL (or QR scan) resolved to a hosted verifier that displays a human readable version. Raw JSON data can be viewed via the JSON tab and the full credential can be downloaded via the download button.

Overview

The digital facility record (DFR) is issued by the owner or operator of a production or manufacturing facility and is the carrier of **facility data and sustainability information** for an identified facility in the value chain. It is very similar to the digital product passport except that it describes a facility rather than a product. The DFR is discoverable in the same way as a DPP - namely by resolving the facility ID to an Identity Resolver service that will return links to facility records. The sustainability performance metrics are also at the facility annual total level rather than at the product level. In many value chains, facility level information may be sufficient to meet the due diligence requirements of buyers and so the facility record can be used independently of the product passport. However product passports should reference the facility at which the product was produced. Where both facility and product information are available, verifiers can perform an approximate mass-balance assessment for quantity based criteria such as GHG emissions. For example, the total individual emissions recorded in all products shipped from a facility should approximately equal the reported annual emissions of the facility.

Conceptual Model

TBA

Requirements

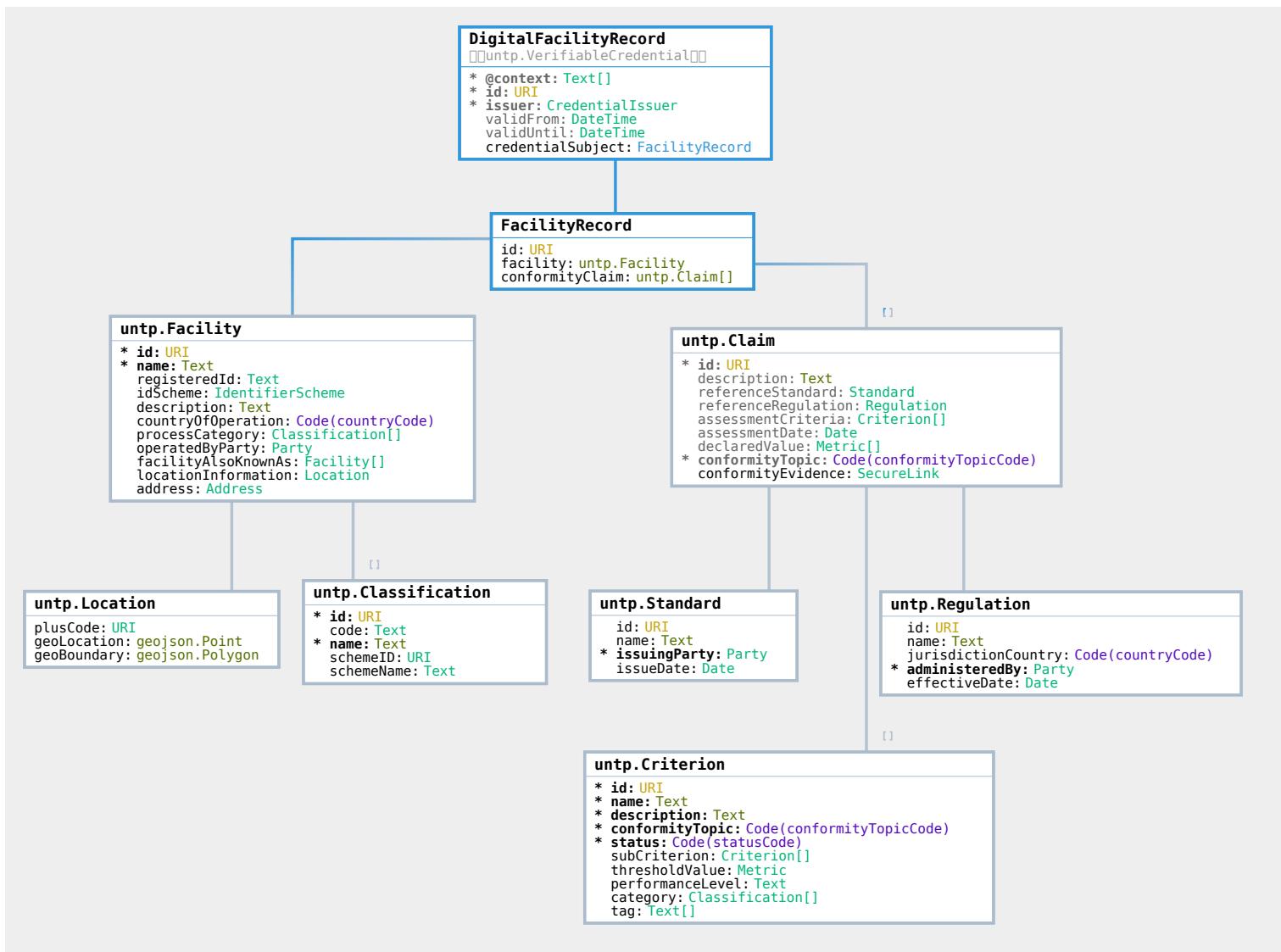
The digital facility record is designed to meet the following detailed requirements as well as the more general [UNTP Requirements](#)

ID	Name	Requirement Statement	Solution Mapping
DFR-01	Resolvable ID	Each facility must have at least one resolvable identifier that can be used in digital product passports and other data exchanges so that verifiers can always access the latest facility data.	Facility.id
DFR-02	Process categories	The DFR should support any number of industry process classifications using codes from a defined classification scheme (eg UN-CPC)	Facility.processCategory
DFR-03	Geo-Location	The DFR should provide a means to specify both a geo-location point (aka pin) and a boundary geometry (aka polygon) so that verifiers can geo-locate supplier facilities	Facility.locationInformation
DFR-04	Owner / operator	The DFR should specify the owner and/or operator entity of the facility using one or more globally unique and resolvable entity identifiers.	Facility.operatedByParty is a UNTP Party structure that meets this need.
DFR-05	Declarations	The DFR MUST provide a means to include any number of conformity declarations so that it can provide simple single point to aggregate all claims about the facility in one place	The FacilityRecord.conformityClaim array is designed to meet this need
DFR-06	Conformity Topic	The DFR MUST provide a simple mechanism to express the sustainability/circularity/conformity topic for each claim so that similar claims can be grouped and the high level scope easily understood.	The Claim.conformityTopic code list is designed to meet this need
DFR-07	Metrics	The DFR MUST provide a simple mechanism to quantify a conformity claim (eg carbon intensity, water consumption, etc) and to express any accuracy range.	The Claim.declaredValue is designed to meet this need
DFR-08	Criteria	The DFR MUST provide a means to reference a standard or regulation as well as the specific criteria within that standard or regulation - so that claims can	The Claim.referenceRegulation, Claim.referenceStandard and Claim.assessmentCriteria is designed to meet this need

ID	Name	Requirement Statement	Solution Mapping
		be understood in terms of the criteria against which they are made.	
DFR-09	Evidence	The DFR MUST provide a means to reference independent conformity assessments that support and verify the claims being made. The related evidence SHOULD be digitally verifiable but MAY be a simple document or web page. The confidence level attached to the evidence should be clear.	The Claim.conformityEvidence property references a relevant digital conformity credential

Logical Model

The Digital Facility Record is an assembly of re-usable components from the UNTP core vocabulary.



Core Vocabulary Documentation

The [UNTP core types vocabulary](#) defines the uniquely identified Linked Data entities such as Product, Location, Facility, Party, Standard, Regulation, Criteria, Declaration, Attestation, Endorsement. These entities provide the building blocks for construction of the Digital Facility Record.

DFR Documentation

The [DFR documentation](#) provides a technology-neutral definition of classes, properties and code lists in the DFR model.

Implementation Guidance

This section provides sample JSON-LD snippets for each DFR component with guidance on their purpose and usage.

Verifiable Credential

Digital Facility Records are issued as W3C Verifiable Credentials. Please refer to [DPP VC Guidance](#) for information about the use of the verifiable credentials data model for UNTP. The issuing party for the VC should be the facility owner or operator.

Facility Record

The `credentialSubject` is a FacilityRecord object. It comprises

- An identifier `id` unique to this record instance, typically represented as a URI.
- A nested facility object containing detailed information about the physical site.
- A list of conformityClaim objects about the facility made by the facility owner or operator.

```
"credentialSubject": {  
  "type": [  
    "FacilityRecord"  
  ],  
  "id": "example.com/facility-record/1234",  
  "facility": {},  
  "conformityClaim": []  
}
```

Facility

The Facility object nested within FacilityRecord comprises

- An identifier for the facility. This could be a self-issued DID, or an ID managed by an industry association such as a member/facility register, or a global location scheme. Whatever the facility identifier scheme, facility IDs should be resolvable and verifiable.

- The registered id of the facility.
- A short description of the facility.
- The registered name of the facility.
- Details of the identification scheme used to identify the facility.
- The country in which this facility is operating.
- One or more industry process categories, preferably using a global standard classification scheme such as UN ISIC.
- The operatedByParty for the facility, typically identified using a national business register or a global business identifier scheme.
- An optional list of additional identifiers `facilityAlsoKnownAs` from other schemes.
- The semi-structured address for the facility.
- The geolocation information for the facility (using PlusCodes and GeoJSON).

```

"facility": {
  "type": [
    "Facility"
  ],
  "id": "https://samplefacilityregister.org/1234567",
  "registeredId": "1234567",
  "description": "LiFePO4 Battery plant number 7",
  "name": "Example facility 7",
  "idScheme": {
    "type": [
      "IdentifierScheme"
    ],
    "id": "https://examplefacilityregister.org",
    "name": "A facility register"
  },
  "countryOfOperation": "AU",
  "processCategory": [
    {
      "type": [
        "Classification"
      ],
      "id": "https://unstats.un.org/unsd/classifications/Econ/isic/2720",
      "code": "2720",
      "name": "Manufacture of batteries and accumulators",
      "schemeID": "https://unstats.un.org/unsd/classifications/Econ/isic",
      "schemeName": "UN Standard Industry Classification"
    }
  ],
  "operatedByParty": {
    "type": [
      "Identifier"
    ],
    "id": "https://abr.business.gov.au/ABN/View?abn=90664869327",
    "name": "Example Company Pty Ltd.",
    "registeredId": "90664869327",
    "idScheme": {
      "type": [
        "IdentifierScheme"
      ],
      "id": "https://abr.business.gov.au",
      "name": "Australian Business Number"
    }
  }
}

```

```

    },
    "facilityAlsoKnownAs": [...],
    "address": {
        "streetAddress": "level 11, 15 London Circuit",
        "postalCode": "2601",
        "addressLocality": "Acton",
        "addressRegion": "ACT",
        "addressCountry": "AU"
    },
    "locationInformation": {...}
}

```

Location

Facility location is a value object (i.e. it does not have a unique identifier). Its purpose is to locate the facility in a geographic area with whatever degree of resolution required. A location object must include at least one of the following geolocation properties:

- An open location code (also known as [Plus Codes](#)). Plus codes are essentially a grid reference and can define an small area that is virtually a pin location (eg <https://plus.codes/8CGRC78W+MM>) or a much larger area (eg Roughly Madrid city - <https://plus.codes/8CGRC700+>) by removing digits after the "+" and replacing grid digits with an even number of trailing zeros.
- A geoLocation as a [GeoJSON Point](#) as a decimal latitude / longitude pair.
- A geoBoundary as a [GeoJSON Polygon](#) that defines any closed boundary (or collection of closed boundaries) as a sequence of lat/long pairs where the first and last pair represent the same point.

```

"locationInformation": {
    "plusCode": "https://plus.codes/8CGRC78W+MM",
    "geoLocation": {
        "type": "Point",
        "coordinates": [
            40.416688,
            -3.703313,
        ]
    },
    "geoBoundary": {
        "type": "Polygon",
        "coordinates": [
            [
                [
                    [100.0, 0.0],
                    [101.0, 0.0],
                    [101.0, 1.0],
                    [100.0, 1.0],
                    [100.0, 0.0]
                ]
            ]
        ]
    }
}

```

Conformity Claims

Conformity information is included in the Digital Facility Record as an array of UNTP Claim structures. The same structure is re-used for conformity information in Digital Product Passports. Please refer to the [DPP Conformity Information](#) section for further information and examples.

Identity Resolver

!(INFO)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Overview

Identifiers of **businesses** (eg tax registration numbers), of **locations** (eg google pins or cadastral/lot numbers), and of **products** (eg from product registers or self-issued) are ubiquitous throughout supply chains and underpin the integrity of the system. The diagram shows an example of identifiers schemes for three types of entity. These are just a few of thousands of existing identifier schemes. This identity resolver specification builds upon these identifier schemes so that existing investments and high integrity registers can be leveraged. This specification also supports the use of self-issued decentralised identifiers.

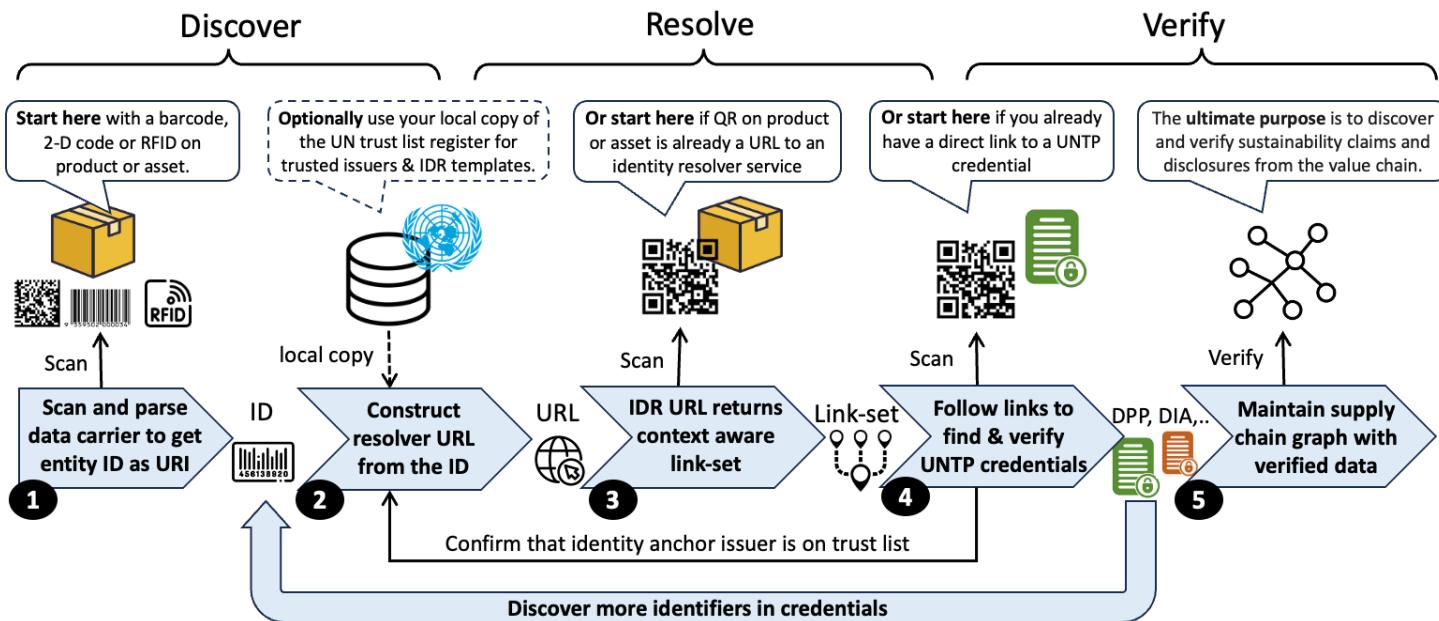
Product		Facility		Organisation	
Scheme	Cow  NLIS	Farm 	PIC	Farmer 	ABN
ID	nlis.com.au		daf.qld.gov.au/pic		abr.business.gov.au
	QDBH0132XBS01234		QDBH0132		90664869327

UNTP requires four key features of identifier schemes and, for those that don't already embody these features, provides a framework to uplift the identifier scheme to meet UNTP requirements. Identifiers used in UNTP implementations should be

- **unique** so that there is no risk of collision with identifiers across different schemes,
- **discoverable** either as structured data in documents or easily read by scanning a barcode, QR code, or RFID,
- **resolvable** so that, given an identifier, there is a standard way to find more data about the identified thing, and
- **verifiable** so that claims about identifiers made by the identifier's controller can be distinguished from reviews and other third party claims.

Conceptual Model

A fundamental UNTP principle is "given an ID of a thing, I can find verifiable data about that thing". This Identity Resolver (IDR) specification describes how this is achieved.



A typical IDR workflow is as follows.

1. Each item in an inbound shipment of supplies to a manufacturing facility is barcoded - using the same well known barcode scheme that has been in use for many years (so nothing special for UNTP). A barcode reader captures the identifier of an item - eg 1234567.
2. The scanner system may already know how to construct a URL from the ID (eg following ISO/IEC 18975) or may lookup the scheme in a local copy of the UN global register of schemes. A resolver template such as <https://resolver.example/{id}> can be used to replace {id} with the actual identifier to get <https://resolver.example/1234567>.
3. Calling the URL <https://resolver.example/1234567> returns an [IETF link-set](#) that includes one or more links (also URLs). Each link is annotated so that the type of information provided by the link is declared. **Link types** may include things like product safety data sheet, instruction manual, brand homepage, a digital product passport (DPP), and a digital conformity credential (DCC). Further annotations are used to declare things like the format of the linked information (HTML, PDF, JSON etc.). This is achieved using [IANA-registered Media Types](#).
4. A link typed of `dpp` with a format declaration of `application/vc` is a hint that the target URL will yield a UNTP DPP credential which is verified to confirm integrity. The DPP includes several sustainability claims including the emissions footprint of the product, which the manufacturing facility can use to calculate the contribution of the received item to their scope 3 total. Following the DCC link type yields a conformity credential issued by a third party certifier that attests to the carbon intensity of the product.

Working with DIDs

[Decentralized Identifiers](#) (DIDs) have features that match the UNTP requirements in a slightly different way. They are globally unique, discoverable, resolvable and verifiable, and can be resolved to a set of links to related information, such as verifiable

credentials. In that regard, the concepts are exactly the same as described above. However, the terminology and methodology differ.

A DID resolves to a DID Document (DID Doc) that contains the cryptographic material (public key) necessary to prove control of the identifier. Full details of how this is done are defined in the [W3C standard](#). Importantly from a UNTP perspective, a DID Doc can include 'service endpoints', that is, links to information about the identified thing. Those services themselves are described by a `serviceType` parameter which performs the same function as the `linkType` parameter when querying a linkset through an ISO/IEC 18975-conformant resolver. The DID Doc therefore can perform the same function as a linkset. The DID resolution standard defines how a DID can be resolved and one or more services of the requested service type can be requested. The DID method defines where the DID document is located and how to perform CRUD (create, revoke, update, delete) operations.

Other DID methods can be used to resolve from a DID to associated data such as did:ethr or did:ebsi. In those methods the did:document is stored on a blockchain network (here Ethereum or EBSI) and thus the CRUD methods are implemented in a different way. At the time of writing, another very promising method of resolving a DID and accessing a specific type of information about the identified item is close to being standardized. The emerging `[did:webvh]([url](https://identity.foundation/didwebvh/v1.0/))` specification includes the `/whois` feature that can be used to access a Verifiable Presentation of one or more Verifiable Credentials. These may be DPPs, DCCs etc. In the current context, it is therefore expected that a software environment that can process DIDs and VCs will be able to use standardized methods to resolve the DID, locate and verify the DPP(s) and any other data about the identified item.

Note that, whatever identifier is used for the product, facility, supplier or certifier, the DPP and DCC both include an issuer DID like `did:web:sample-supplier.com` and `did:web:sample-certifier.com` which resolve to DID documents that link to [digital identity anchor](#) credentials confirming the identity of the supplier and certifier. The DPP also contains the ID of the manufacturing facility which can be resolved in the same way as the product ID and therefore can be used to find facility level credentials such as fair work certificates. In this way a due-diligence [transparency graph](#) can be created by the manufacturer, providing strong evidence of regulatory compliance and sustainability performance.

The process is very flexible

- If instead of a barcoded item arriving at a manufacturing plant, it were a cow arriving at a processing plant, the same process would work using the livestock identifier encoded in the RFID tag on the cow's ear. The link-set would include a livestock passport which would, in turn, include the ID of the farm which could be used to find a deforestation credential for the farm.
- If the supplier of goods to the manufacturer switched from 1D barcodes to QR codes at any time, then this just means that step 2 is not needed because the QR is already likely to be an IDR URL that will return a link-set.
- If the barcode or QR is on a finished product and is scanned by a consumer in the EU using a smartphone then the IDR can use `http` header user context information to return the DPP by default (with additional links as options) and in the language of the user settings.
- The same core functionality can be achieved using Decentralized Identifiers, although the technology stack is different.

In this way, a single data carrier, whether a traditional barcode or a QR code, provides access to a wealth of further information which can be tailored to suit the user context - irrespective of whether the user is a human or a machine.

Requirements

This section defines the formal requirement statements for Identity Resolver implementations.

- **Scheme** means an identifier scheme such as a national business identifier scheme.
- **Carrier** means a machine readable device such as a barcode, QR code, RAIN or NFC tag that encodes an identifier issued under a scheme.
- **Link** means a URL that points to a page or document or credential that contains further information related to the identifier.
- **Target** means the document or credential that the link references.
- **link-set** means a collection of links with meta-data that describe each link.
- **Resolver** means an implementation of this specification that returns a link-set about a given identifier.

ID	Short name	Requirement	Solution Mapping
IDR-01	Global uniqueness	All identifiers, whether for products, assets, facilities, or businesses used in UNTP credentials MUST be globally unique so that they can be unambiguously referenced and resolved.	Globally Unique Identifier Representation
IDR-02	One carrier, many links	One data carrier on a physical product or asset MUST be able to reference any amount of linked data or documents so that user or system confusion from multiple carriers on products can be avoided	Identity resolver services
IDR-03	Leverage existing schemes	Existing identifier schemes MUST be usable for UNTP IDR functions so that existing investments can be leveraged and UNTP rollout can be accelerated because there is no need to re-tool existing identifier infrastructure.	This specification supports any identifier scheme.
IDR-04	Leverage existing carriers	Existing data carriers, whether 1D barcodes on products or RFID tags on livestock are entrenched and unlikely to change quickly. Therefore identity resolvers MUST be able to work with existing carriers so that digitalisation can proceed at pace without the need to re-tool existing physical scanning infrastructure.	Data carriers
IDR-05	Seamless transition to 2D	As industry transitions from 1D barcodes to 2D/QR codes, the UNTP identity resolver process MUST work equally well with either so that implementers can transition at their own pace	The Conceptual model - either create a resolver query from an 1D barcode / 2D matrix or embed the query into a QR.
IDR-06	Understanding link-sets	When a link-set is returned by a resolver, each link MUST include sufficient meta-data so that user systems can	Identity resolver services

ID	Short name	Requirement	Solution Mapping
		understand the purpose and usage of each link as well as the relationship between links	
IDR-07	Filtering link-sets	Resolvers MUST allow users to request specific links, all links, or (if unspecified) then receive a default link - so that user experience can be optimised.	IDR Query
IDR-08	Responsive links	Resolvers SHOULD leverage available user information such as language preferences to return tailored link-sets and default links - so that user experience is optimised.	Defaults and Automatically returning the right language
IDR-09	Logical grouping of links	Link-set meta-data SHOULD provide an ability to group related link targets such as a product passport and related traceability events - so that user experience can be optimised.	
IDR-10	Versioning of link targets	When multiple version of link targets exist (eg multiple version of a product passport) then resolvers MUST include version information in link metadata and MUST ensure that any defaults reference the latest version - so that users receive current information and can audit historical data	Versioned targets
IDR-11	Resolver redirection	Resolvers SHOULD, where available, include links that reference secondary resolvers so that product/facility owners can maintain additional document and credential links in their own resolvers. A typical example is the case where a global scheme maintains identifiers only at product class level but the manufacturer manages identifiers and related data at serialised item level. In such cases the primary resolver would say "here's what I know about the product and here's a link to another resolver that can tell you about the serialised item"	Secondary resolvers
IDR-12	Self-issued product identifiers	This specification MUST support self-issued identifiers so long as they are equally discoverable, resolvable, and verifiable - so that each value chain actor is free to make their own choice between third party product registers and self-managed product registers without any lock-in.	Decentralised Identifiers and DID to IDR linkset
IDR-13	Existing standards	This specification SHOULD use existing standards such as ISO/IEC 18975 and IETF RFC 9264 so that implementers can maximise re-use of existing infrastructure and maintain interoperability.	ISO/IEC 18975 is the basis for mapping an ID to a query. IETF RFC 9264 is the bases for the structure of the linkset response.

Globally Unique Identifier Representation

Linked Data Needs

Linked data architectures, of which UNTP is an example, depend on unique and consistent identifiers of entities such as product and facilities so that they can be matched across different credentials. For this reason [URIs](#) are heavily used as identifiers of entities throughout UNTP credential types. But without consistency in the way globally unique identifiers are constructed, there is a high risk that valuable links are not made. For example, consider the same product identified in two credentials:

- A digital product passport issued by a manufacturer with a sustainability claim about product `http://product.sample-register.example/123456789`
- A digital conformity credential with a third party sustainability assessment about product `urn:example:sample-register:product:123456789`

Although these are the same product, the construction of the ID is different and so a validation that attempts to confirm that a product passport claim is genuinely supported by third party assessment may fail.

There are thousands of identifier schemes in active use around the world and only a few have well defined conventions for consistent representation of their identifiers as globally unique URIs. To address these challenges, in this section, we define conventions for the consistent representation of identifiers that can be leveraged by any existing or new identifier scheme, whether the identifiers are managed by an issuing authority or self-managed.

Uniform Resource Name (URN)

[URNs](#) are a type of URI that are designed to be used as globally unique and persistent identifiers that remain available long after a specific resource that they identify ceases to exist or becomes unavailable. URNs MAY be used for any identifier and SHOULD be used as persistent identifiers for long lived entities such as organisations, facilities and long-lived products.

In patterns below,

- `{identifier-scheme}` is any string of characters permitted in URN Namespace Specific Scheme (alphanumeric characters, hyphen, period, underscore, colon).
- `{identifier-value}` is the string of characters after the last colon (limited to alphanumeric characters, hyphen, period, underscore).

For existing IANA registered URN namespaces

Use your IANA registered [URN namespace](#).

- pattern `urn:{ns}:{identifier-scheme}:{identifier-value}`

For all other schemes

Either register your own scheme with IANA or use the UN global trust register [gtr](#) URN namespace (IANA registration pending).

- pattern: `urn:gtr:{identifier-scheme}:{identifier-value}` where `gtr` represents the UN global trust register namespace.
- examples:
 - `urn:gtr:register.business.gov.xx:90664869327` - representing any typical national business registration number
 - `urn:gtr:nlis.com.au:QDBH0132XBS01234` - representing an Australian livestock identifier

The `gtr` namespace represents identifier schemes that are listed in the UN global trust register (GTR). When the `gtr` namespace is used, the `{identifier-scheme}` MUST be a DNS domain name comprising URN allowed or percent-encoded characters (ie no `/` unless encoded as `%2F`).

Uniform Resource Locator (URL)

[URLs](#) are a type of URI that represent addressable web locations. URLs as identifiers have the advantage that they are immediately resolvable but the disadvantage that they may become dead/broken links whenever a document is moved or a web site is restructured or a domain name changes.

IDR URLs as identifiers

When URLs are used as identifiers in UNTP credentials they SHOULD be Identity Resolver URLs that conform to the ISO/IEC 18975 *structured path syntax* without parameters.

- pattern: `https://:{identifier-scheme}/{identifier-value}` where `{identifier-scheme}` is a DNS domain name (without `/` characters unless `%2F` encoded) and `{identifier-value}` is a valid ISO/IEC 18975 path (which can include `/` characters to separate class, sub-class, and instance id as defined in ISO-18975)
- examples:
 - `https://products.sample-company.example/1234567`
 - `https://facilities-register.example/ABC123456`
 - `https://example.com/01/733240226591`
 - `https://example.com/01/733240226591/21/1234`

When a given identifier scheme uses both URN and URL mechanisms to represent identifiers as URIs then the `{identifier-scheme}` part SHOULD be the same for both. If the identifier scheme is registered in the UN global trust register then the `{identifier-scheme}` MUST match the corresponding scheme ID in the trust register.

Decentralised Identifiers (DID)

Decentralised Identifiers ([DIDs](#)) are a type of URI that are resolvable and verifiable by design. They are self-issued by any party and do not depend on any central register or issuing authority. The general structure of a DID is defined by the [W3C Decentralised Identifiers recommendation](#)

This section shows how the DID method `did:web` can be used to define a globally unique product, company or facility DID and a discoverable deep link to the data associated with that DID. Every DID is associated with a DID Document. The digital product passport use case is used to show how to resolve from the globally unique product DID to the digital product passport data.

Apart from the CRUD operations, the DID method also defines the secure ledger where the DID document is stored and can be discovered. In did:web the DID Doc is stored on the web domain in the `/.well-known` folder.

To resolve the DID to the digital product passport, it needs to be combined with a DID `resolver domain` the globally unique `product DID` and optionally a `service endpoint`:

- **resolver domain** The DID resolver implements the did method and returns the DID document to the requestor. A free DID resolver is e.g. the [Universal Resolver](#). The DID resolver can be freely chosen by the economic operator or can be built in-house.
- **product did** The `product DID` - when using did:web - is a combination of three elements: 1. The DID Method (here did:web), 2. the Economic Operator domain that places the product on the market and where the DID document can be found in the `/.well-known` folder of that domain, 3. the product identifier unique to that domain.
- **service endpoint** The `service endpoint` can lead to different information e.g. a human readable DPP, a service API, or a DPP credential credential store.

The resulting URL including the `resolver domain` combined with `product DID` and `service endpoint` leads to the deep link of the digital product passport.

The table below shows the ingredients of a DID based DPP deep link URL.

Component	Description	Value
Resolver	DID resolver domain used to resolve the DID	<code>https://resolver.io</code>
DID Method	Method part of the DID – defined CRUD rules	<code>did:web</code>
Economic Operator domain	Domain that is under the control of the economic operator and that hosts the DID document	<code>abc.com</code>
ID	Identifier that is unique to the product in the economic operator domain	<code>model4TR</code>
Product DID	This is the globally unique product identifier in form of a decentralised identifier (DID)	<code>did:web:abc.com:model4TR</code>
Service Endpoint	Optional service endpoint parameter specifying what information to retrieve from the DID	<code>?service=item-dpp</code>

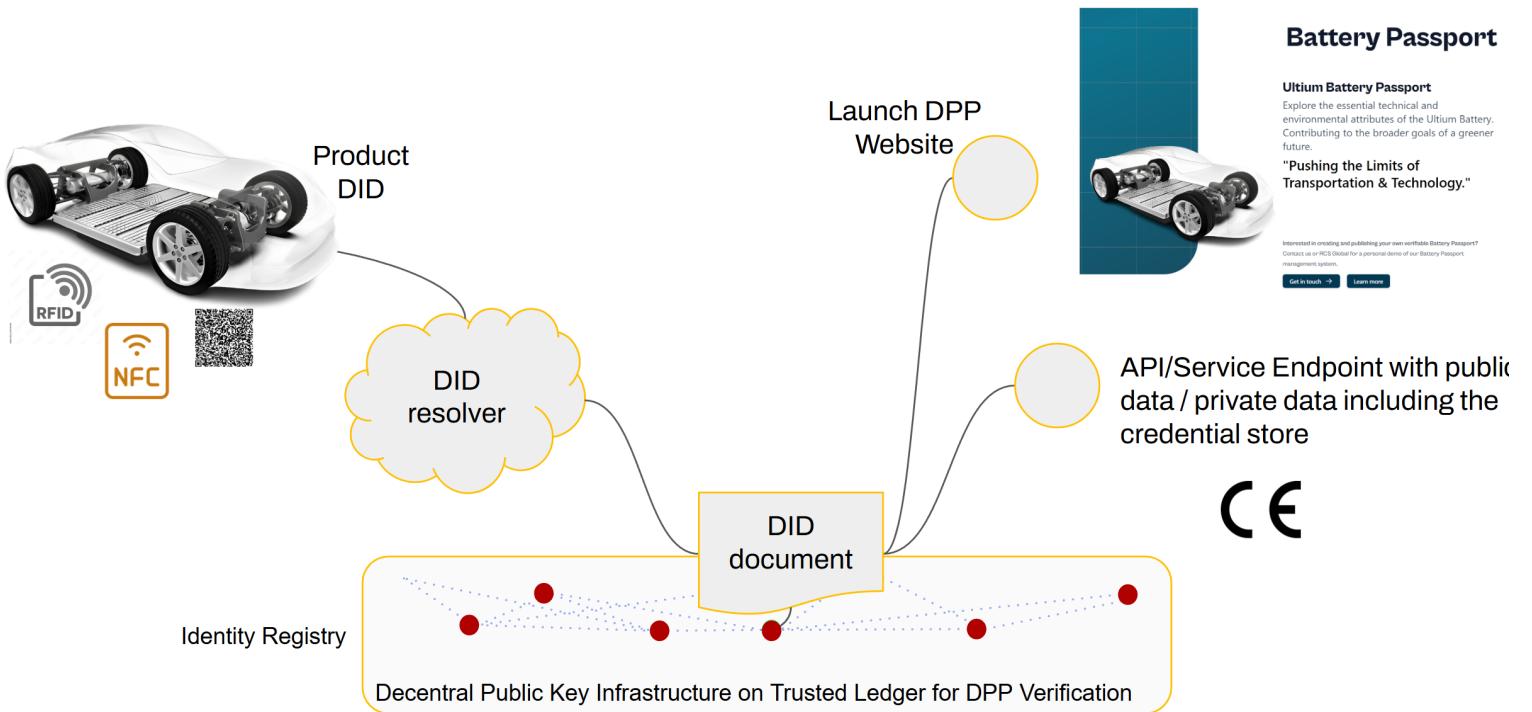
The deep link URL to the digital product passport is accordingly: `https://resolver.io/did:web:abc.com:model4TR/?service=item-dpp`

It can be then put to different data carriers, such as QR codes, RAIN tags, or NFC tags. Below please find a QR code example carrying the DPP deep link (not resolvable):



The figure below shows the information flow of accessing a digital product passport.

*The DPP deep link is scanned from the QR code, then *the DID resolver is called and finds the DID document of the product DID. *The DID document includes the human readable Battery Passport website URL under the provided service endpoint which is given back to the user who scanned the QR code. *The user can explore the battery passport website.



Universally Unique Identifier (UUID)

As an alternative to being issued by an issuing agency, identifiers can be algorithm-generated. The best-known example of this is the Universally-Unique Identifier (UUID). This relies on it being *extremely* unlikely, but not impossible, that the same identifier will be generated twice. For many practical applications, that can be "good enough" although there are some instances where duplicates have arisen (known as "collisions").

UUIDs as the complete identifier

When using a UUID as the identifier for an entity, the syntax would be

- pattern: `uuid:{UUID}`
- example: `uuid:709f3df6-4cdf-4bda-94d9-ce0ec9428616`

Such identifiers have no scheme information which could be used for resolvability and verifiability. Therefore usage **SHOULD** be limited to cases where there is no need for discovery of further data.

UUIDs as the scheme specific identifier value

UUIDs can be useful as scheme specific identifiers, particularly when there is value in the identifier being un-guessable. For example as a means to limit visibility of item specific data to the genuine holder of the goods - as described in the [UNTP Decentralised Access Control](#) specification.

- pattern: `{uri-scheme}:{identifier-scheme}[:or/]{UUID}`
- examples:
 - `urn:gtr:products.sample-register.example:709f3df6-4cdf-4bda-94d9-ce0ec9428616`
 - `https://products.sample-register.example/709f3df6-4cdf-4bda-94d9-ce0ec9428616`

Discoverability

This section describes the challenges and solutions in the first step of the [identity resolver conceptual model](#) - from an identifier encoded in some kind of data carrier to a consistent URI representation. UNTP does not define any new data carrier standards but rather aims to support any existing or future scheme.

Data Carriers

The term "data carrier" covers all 1D and 2D barcode symbols and RFID tags. Many exist, including proprietary ones, but for UNTP, the recommended carriers are those defined by [ISO/IEC JTC 1/SC 31](#), such as linear barcodes, [Data Matrix](#), [QR Codes](#), and RFID. While these standards define the carrier format, they do not dictate identifier types, encoding syntax, or required devices, making "Automatic Identification and Data Capture" (AIDC) a specialized field.

Discoverability depends on equipment and software. RFID requires specialist readers, capable of scanning multiple tags without line of sight. Optical scanners can read various barcodes, but their software must interpret the data correctly. The more standardized the identifiers and encoding, the more interoperable and discoverable they are, leading industries to favor established systems.

Modern smartphones can read most optical barcodes and NFC tags via apps, enabling decentralized identifiers (DIDs) and alternative schemes. However, **QR Codes with URLs** are the most discoverable, as native camera apps can instantly open links. Yet, URL-based identifiers pose risks like "link rot" and incompatibility with offline systems. [ISO/IEC 18975](#) addresses this by embedding structured identifiers within *structured path* URLs, balancing broad accessibility with specialist data use.

In **Automatic Identification and Data Capture (AIDC)**, the [ISO/IEC 15459](#) series establishes a registry for short codes in data carriers. Organizations issuing barcode and RFID identifiers receive a unique **Issuing Agency Code** to prevent conflicts. [ISO/IEC 15418](#) defines **Data Identifiers (DIs)** and **Application Identifiers (AIs)**, which qualify identifiers, ensuring globally unique encoding in optical and RFID data carriers.

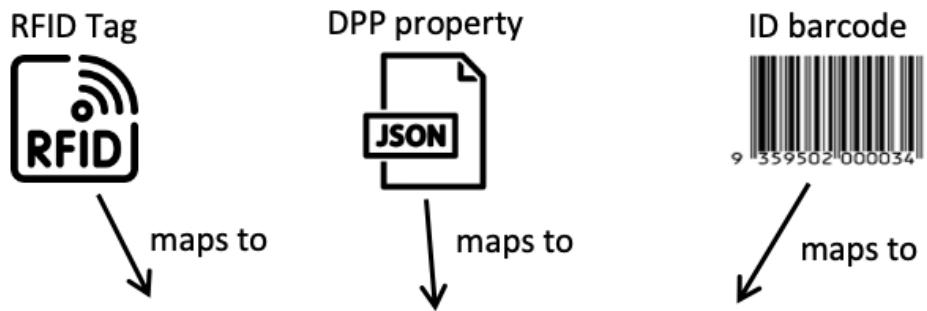
For example:

- **DI 2B** identifies gas cylinders per U.S. D.O.T. standards.
- **AI 01** represents a **Global Trade Item Number (GTIN)**.

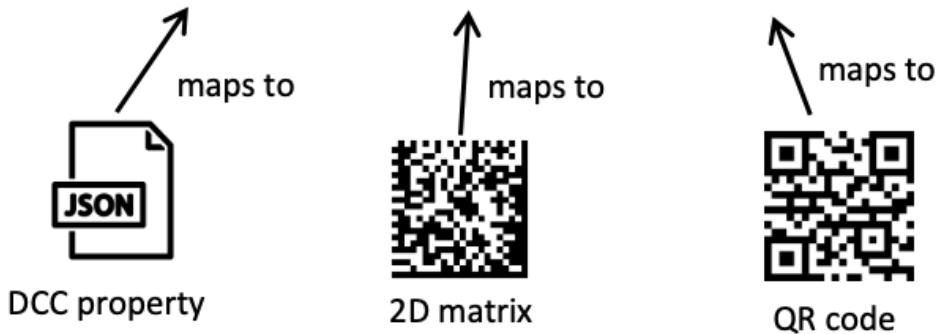
Mapping to consistent URIs

A key challenge is to ensure that all these different data carrier representations are mapped to a consistent globally unique identifier when building value chain transparency graphs.

- A 2D Matrix code might yield the string `0107332402265910211234567890240+A01=442.001-UP001T91456498765498765465432132168753` where `733240226591` is the product ID (with company prefix) and `1234567890` is the serial number
- An RFID Tag for the same product might yield a string like `urn:epc:tag:sgtin-96:1.7332402.026591.1234567890` where `7332402.026591` is the product ID and `1234567890` is the serial number.
- A QR code may yield `https://id.sample-resolver.example/01/733240226591/21/1234567890` where `733240226591` is the product ID (with company prefix) and `1234567890` is the serial number.



{URI scheme}:{Identifier scheme}:{identifier value}



Existing data carrier schemes are very varied but usually well documented. Therefore it is reasonable to expect that scanners will be aware of the context and will include scheme specific logic to read the data carriers and construct UNTP standard URNs or URIs to match against identifiers using in credentials such as digital product passports.

For new identifier schemes or existing schemes that have not already defined data carrier specifications, UNTP implementers SHOULD

- directly encode the UNTP URN structure into 2D matrix codes and RFID tags.
- directly encode the UNTP URL structure into QR codes.

Resolvability

This section describes the challenges and solutions in the second and third steps of the [identity resolver conceptual model](#) - from a consistent URI representation of an identifier to a [link-set](#) about the identified entity. In the context of UNTP, that means easily resolving a product or facility identifier to credentials such as the identified product's DPP or the identified facility's DFR.

Identity Resolver Services

This UNTP identity Resolver (IDR) specification builds upon these existing standards by defining some specific constraints that improve interoperability and meet UNTP specific requirements.

Identity Resolver Example

IDR Query URL

IDR queries are URLs that take the general form

`https://domain}/{path}?{query}` where

- `domain` is the web domain of the resolver service, usually operated by the identifier scheme register - eg `resolver.sample-register.example`
- `path` carries the specific ID of the product or facility being queried and may include qualifiers - eg `products/ABCD9876/items/1234`
- `query` contains a list of URL parameters that are used to filter the response - eg `linkType=untp:dpp&language=en`

A typical IDR query might be something like this

`https://resolver.sample-register.example/products/ABCD9876/items/1234?linkType=linkset`

which is requesting

- the complete link-set
- about a product class `ABCD98765`
- issued using an identifier scheme supported by `sample-register.example`
- with specific serial number `123456789`

To get a different response, the query might be modified as follows

- `https://resolver.sample-register.example/products/ABCD9876?linkType=linkset` to get data about the product class only, not a specific serialised item.
- `https://resolver.sample-register.example/products/ABCD9876/items/1234?linkType=untp:dpp` to get only the DPP for the item.
- `https://resolver.sample-register.example/products/ABCD9876/items/1234?linkType=all&language=de` to get all links to German language targets.
- `https://resolver.sample-register.example/products/ABCD9876/items/1234` to get a redirect to the target of the `default` link.

IDR LinkSet Response

The response to an IDR query is an IETF `linkset` which contains one or more `contexts`, each of which contain one or more `targets`.

- a context describes what the links are about using the `anchor` property. Often there is only one `anchor` that represents the requested `identifier`. But as described in the [resolver workflow](#), a resolver may return links about related entities. For example a query about a specific serialised item may return some links about the item, and some links about the product class, and even some links about the manufacturer or brand that sells the product.
- a target describes a specific link identified with the `href` property together with other properties that provide useful meta-data about the link.

A typical response to the sample query `https://resolver.sample-register.example/products/ABCD9876/items/1234?linkType=linkset` might be as shown in the snippet below.

- there are two `contexts`, one is at serialised item level `"anchor": "https://resolver.sample-register.example/products/ABCD9876/items/1234"` and one is at product class level `"anchor": "https://resolver.sample-register.example/products/ABCD9876"`.
- the first context has two `targets`, both of which have a linkType "untp:dpp" (UNTP digital product passports) and MIME type `application/vc+jwt` but one is rendered in German and the other in English.
- the second context is at product and has one target which points to the manufacturers product information web page. This highlights that link resolvers can return all kinds of relevant links, only some of which point to UNTP credentials.

```
{
  "linkset": [
    {
      "anchor": "https://resolver.sample-register.example/products/ABCD9876/items/1234",
      "untp:dpp": [
        {
          "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",
          "type": "application/vc+jwt",
          "title": "Digital Product Passport",
          "hreflang": ["en"]
        },
        {
          "href": "https://sample-credential-store.example/credentials/dpp/90664869311.json",
          "title": "Digitaler Produktpass",
          "hreflang": ["de"],
          "type": "application/vc+jwt"
        }
      ]
    },
    {
      "anchor": "https://resolver.sample-register.example/products/ABCD9876",
      "sample:pip": [
        {
          "href": "https://sample-company.example/productInformation/ABCD9876",
          "type": "text/html",
          "title": "Product Information"
        }
      ]
    },
  ]
}
```

Creating the IDR Query URL

There are several forms in which an identifier might be discovered (eg as a data carrier on a physical product or as a URI in a structured document). The identifier representation format is often not an IDR query URL and so may need to be translated into an IDR URL query format. As shown in the [conceptual model](#), the generalised process to derive an IDR query URL has two steps

- Map the native format found in a data carrier to a consistent global URI as described in the [globally unique identifier representation](#) section.
- Map the global URI to an IDR query string as described in the following paragraphs.

This mapping architecture is designed to ensure that UNTP can accommodate any new or existing identifier scheme and any data carrier and still maintain linked data consistency (ie consistent URI representation) as well as resolvability and verifiability of identifiers.

From a URN to IDR linkset

The UN global trust register will include resolver templates for each scheme and so the UNTP requirement that identifiers be resolvable is met by substituting the URN `{identifier-value}` into the `{id}` placeholder in the resolver template related to the matching `{identifier-scheme}`. For example

- given a URN ID of `urn:gtr:nlis.com.au:QDBH0132XBS01234`, the `{identifier-scheme}` is `nlis.com.au`
- and a resolver template of `https://resolver.nlis.com.au/{id}` is registered for scheme `nlis.com.au`
- then the resolver URL would be `https://resolver.nlis.com.au/QDBH0132XBS01234` which would return an [IDR LinkSet](#)

From a URL to IDR linkset

As described in [IDR URLs as identifiers](#), URL identifiers SHOULD already be Identity Resolver URLs that conform to the ISO-18975 structured path syntax without parameters. Client applications may of course add parameters to the URL before calling the resolver service to get more specific link sets.

From a DID to IDR linkset

By design, all DIDs resolve to a URL that addresses a DID document. The way in which a DID resolves to a DID document is specific to the DID method. In the case of DID web, the resolution works by replacing ":" with "/" and appending "did.json".

- DID : `did:web:sample-company.example:products:123456789` is an example of a product identifier the did:web scheme.
- URL : `https://sample-company.example/products/123456789/did.json` would be the URL of the DID document according to [did:web method specification](#)

The DID document `did.json` has a standard data model defined by the W3C DID recommendation [core properties](#). It is primarily designed to define the cryptographic methods by which control of a DID can be verified, including associated public keys. The DID [service](#) property can be used to reference further information such as UNTP credentials like a digital product passport. The UNTP approach to using a DID document as a resolver service combines conformant use of DID `service` properties with maximum alignment with IETF linksets.

- The DID document `service.id` property is the same as the linkset `anchor` property with the optional `#fragment` suffix to ensure that `service.id` is unique.
- The DID document `service.type` property is the same as the linkset `linkType` value.
- The DID document `service.serviceEndpoint` property is exactly the same as the the linkset `target` object.

```
{
  "id": "did:web:sample-company.example:products:123456789",
  ..other did document properties ..
```

```

"service": [
    {
        "id": "did:web:sample-company.example:products:123456789#untp:dpp",
        "type": "untp:dpp",
        "serviceEndpoint": {
            "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",
            "title": "Digital Product Passport",
            "hreflang": ["en"],
            "type": "application/vc+jwt"
        },
        "id": "did:web:sample-company.example:products:123456789#untp:idr",
        "type": "linkset",
        "serviceEndpoint": {
            "href": "https://resolver.sample-company.example/products/123456789",
            "title": "Identity Resolver Service",
            "type": "application/linkset+json"
        }
    }
]
}

```

The example above shows two ways of using the DID document serviceEndpoint as an identity resolver service.

- The first target references a UNTP DPP credential directly.
- The second target references a resolver service end point which itself would return a linkset.

In this way, simple scenarios can be achieved simply by placing link targets directly in the DID document whilst richer and more dynamic link resolver services can also be delivered by including a DID document service which is itself a link resolver.

Link-set Response Variations

This section covers specific linkset use cases that SHOULD be supported by conforming link resolvers. The general approach to solving linkset specific needs is

- Where possible, always use IETF linkset standard properties and IANA standard link types.
- Where necessary, use custom link types and linkset properties but always define them in a public vocabulary and reference them using a profile link type.

Defaults

Default link types allow a resolver to return just the target URL of the default link - which means that client applications (including just a camera on a mobile phone) need not have any knowledge of link resolvers and how they work.

Link resolver services SHOULD define DEFAULT link type for each `anchor` which defines the `href` target to which a client will be redirected when no `linkType` is specified in the matching query URL. In the previous [IDR example](#), calling the resolver URL without a `linkType` parameter;

`https://resolver.sample-register.example/products/ABCD9876/items/1234?linkType=linkset`

Would redirect the client directly to the target `href` of the default link type

`https://sample-credential-store.com/credentials/dpp-90664869327.json`

Automatically Returning The Right Language

HTTP headers often contain `accept` header properties that can be useful hints for link resolver behaviour. For example browsers will normally include a language accept header that matches the users configured preference. This can be used to return only those links that match the users language even if the IDR query string does not specify a preference. For example, consider an IDR that

- defines a default link type as `untp:dpp`
- maintains DPP links in a dozen languages

and receives the following HTTP query URL

```
GET /products/123456789 HTTP/1.1
Host: resolver.sample-company.example
Accept-Language: de
```

Even though there are a dozen DPP links maintained by the IDR service, only one of them is in German and so the IDR can again redirect the client to the specific target URL of the German language DPP.

```
https://sample-credential-store.example/credentials/dpp-90664869311.json
```

Secondary Resolvers

There are some cases where an identifier scheme owner manages identifiers at a coarse granularity by issuing globally unique prefixes but allows the subject to manage more fine grained identifiers themselves. For example

- A product register maintains product identifiers in a single global register but management of serialised items is left to the owner of the GTIN.
- IATA issues 3 character carrier identifiers but allows each carrier to add the 7 digit suffix for each cargo consignment to make a globally unique 11 digit consignment number.
- Australian government manages 8 alpha-numeric character farm identifications codes such as `QDBH0132` and allows each farmer to add a unique suffix to identify each unique livestock animal born on the farm.
- and many more examples exist.

The result is that a client may construct an IDR query to the genuine scheme operator's IDR service but that service may not hold information at the requested granularity. In such cases, a conformant IDR SHOULD return links relevant to the more coarse grained item and, if available, a link to a secondary resolver service (eg hosted by the serialised product manufacturer) that can return more fine grained information. For example the following query to a link resolver about a serialised item

```
https://resolver.sample-register.example/products/ABCD9876/items/1234
```

May return a link to a secondary resolver that maintains data at serialised item level as well as a link to a DPP at product class level.

```
{
  "linkset": [
```

```
{
  "anchor": "https://resolver.sample-register.example/products/ABCD9876/items/1234",
  "linkset": [
    {
      "href": "https://resolver.sample-company.example/products/ABCD9876/items/1234",
      "rel": ["untp:idr", "ns1:handledBy"],
      "title": "Secondary Identity Resolver",
      "hreflang": ["en"],
      "type": "application/linkset+json"
    }
  ]
},
{
  "anchor": "https://resolver.sample-register.example/products/ABCD9876",
  "untp:dpp": [
    {
      "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",
      "title": "Digital Product Passport",
      "hreflang": ["en"],
      "type": "application/vc+jwt"
    }
  ]
},
]
}
```

Versioned Targets

In some cases, a publisher may wish to maintain multiple versions of a credential as available links in a linkset. The recommended method is to add the relevant IANA version link relation to the `rel` value array as shown in the example below. In this case there are two links for the same anchor, both include `untp:dpp` as a link relation value but one also has the IANA link relation `predecessor-version`

```
{
  "linkset": [
    {
      "anchor": "https://resolver.sample-register.example/products/ABCD9876",
      "untp:dpp": [
        {
          "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",
          "title": "Digital Product Passport",
          "hreflang": ["en"],
          "type": "application/vc+jwt"
        },
        {
          "href": "https://sample-credential-store.example/credentials/dpp/90664869111.json",
          "rel": ["predecessor-version"],
          "title": "Digital Product Passport",
          "hreflang": ["en"],
          "type": "application/vc+jwt"
        }
      ]
    }
  ]
}
```

Creating New Links

In some cases, an identity resolver service may wish to accept updates such as creation of new links from appropriately authorised users. For example, adding a maintenance event to a battery passport record after the battery has been sold into the market. An identity resolver SHOULD accommodate this possibility by including a link in the linkset for the given product that specifies how to POST an event to the resolver. In the example below, an `anchor` representing product <https://resolver.sample-register.example/products/ABCD9876> has two links. The first is a simple link to a DPP describing the product. The second describes a method to create a new maintenance event.

- The standard IANA link relation `edit` indicates that the target resource is used to edit the link's context.
- The custom link relation `untp:dte` indicates that the target expects a digital traceability event.
- The custom property `method` indicates that the HTTP header requires a POST method and a secret key in the `X-API-Key` HTTP header property.

```
{  
  "linkset": [  
    {  
      "anchor": "https://resolver.sample-register.example/products/ABCD9876",  
      "untp:dpp": [  
        {  
          "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",  
          "title": "Digital Product Passport",  
          "hreflang": ["en"],  
          "type": "application/vc+jwt"  
        },  
        {"anchor": "https://resolver.sample-register.example/products/ABCD9876",  
         "untp:dte": [  
           {  
             "href": "https://sample-credential-store.com/credentials/dte",  
             "rel": ["edit"],  
             "title": "Create Maintenance Event",  
             "method": ["POST", "X-API-Key"],  
             "type": "application/vc+jwt"  
           }  
         ]  
       }  
     ]  
   }  
}
```

Secure Targets

In some cases the target of a link contains sensitive data that is not generally accessible to the public. In such cases, as described by the [decentralised access control](#) specification, the target of the link is encrypted and requires a decryption key or proof of authorised role to decrypt. The corresponding link in the resolver linkset SHOULD specify the encryption method and allowed list of access roles.

```
{  
  "linkset": [  
    {  
      "anchor": "https://resolver.sample-register.example/products/ABCD9876",  
      "untp:dte": [  
        {  
          "method": "POST",  
          "target": "https://resolver.sample-register.example/credentials/dte?access_token=...&role=...&method=POST",  
          "type": "application/vc+jwt"  
        }  
      ]  
    }  
  ]  
}
```

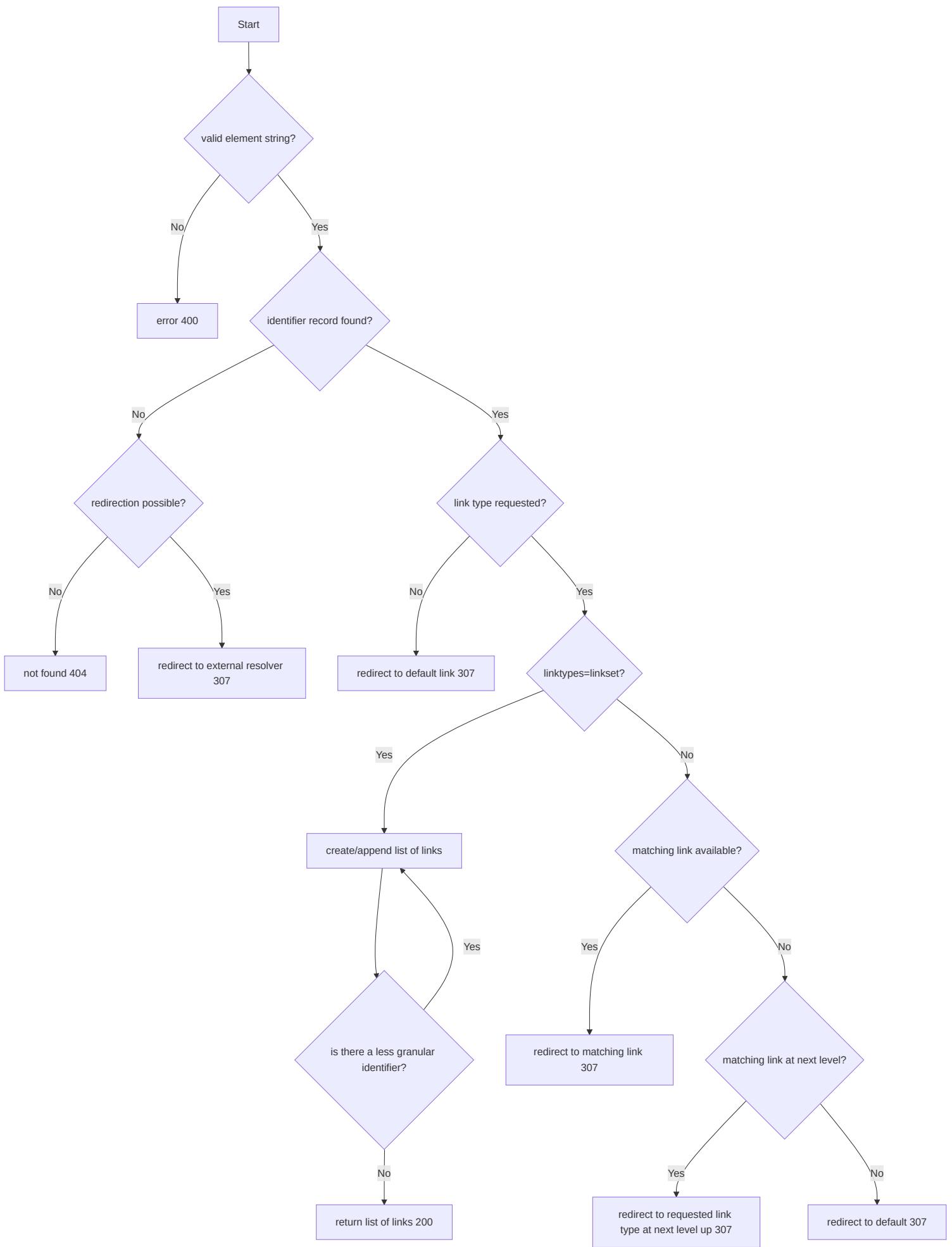
```
{  
    "href": "https://sample-credential-store.example/credentials/dpp/90664869327.json",  
    "title": "Product Traceability",  
    "encryptionMethod": "AES-128",  
    "accessRole": ["untp:accessRole#Owner"],  
    "hreflang": ["en"],  
    "type": "application/vc+jwt"  
}  
]  
]  
}
```

Resolver Service Workflow

The internal workflow of an identity resolver service is not defined by this specification. However, there are some common conditions that a link resolver service SHOULD manage consistently. For example

- When a query URL is not valid
- When there is no data for the requested entity ID.
- When there is no data for an item level ID but there are available links for product class level ID
- When a requested link type does not exist.

These cases are shown in the example resolver workflow diagram below.



Verifiability

Once identifiers have been resolved to a linkset and links have been followed to retrieve UNTP (or other) credentials, then the final step is verification. There are several types of verification.

Verifying Individual Credentials

Each link target that has a `type` property that indicates it is a verifiable credentials (`application/ld+json`, `application/vc+jwt`) SHOULD be verified according to W3C Verifiable Credential validation rules. This verifies

- Integrity (the credential has not been tampered-with)
- Currency (the credential has not been revoked)

The UNTP [Verifiable Credential Profile](#) provides further guidance.

Verifying Identity Integrity

A credential such as a digital product passport can be valid in its own right but may not be valid in context. For example

- The named issuer of the DPP may not be the party they claim to be.
- The DPP might be issued by a party that is not the legitimate owner of the product identifier.

These kind of validation rules are define in the UNTP [Digital Identity Anchor - Use Cases](#) page.

Anti-Counterfeiting

In the particular case of data carriers on physical goods, there is also a counterfeiting risk.

- The product may have copied a valid data carrier from a real product to a counterfeit one.
- The data carrier might resolve to verifiable claims that are about a different product.

Countermeasures to these kind of counterfeiting behaviour are described in the UNTP [Anti-Counterfeiting](#) best practices page.

Chain of Custody Accounting

A particularly important and challenging verification in supply chains is chain of custody / mass-balance accounting.

- A high carbon batch of input materials might be mixed with a low carbon batch of the same commodity and the output may be fraudulently associated with only the low carbon input.
- A verifiable assessment of total emissions of a facility may not be accurately allocated across the individual product shipments from the facility.

Countermeasures to this kind of mass balance fraud are described in the UNTP [chain of custody](#) best practices page.

Verifying Regulatory or Industry Standards Compliance

Verification such as due-diligence across entire supply chains of fair work practices or chain of custody accounting accuracy of mass-balance processes are achieved by verifying entire graphs of data rather than individual credentials. Furthermore, these kind of verification rules tend to be industry and/or geography specific and are defined in [UNTP extension projects](#) rather than UNTP core specification.

Some best practice guidance is available in the UNTP [Transparency Graphs](#) page.

Digital Identity Anchor

!(Info)

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artifacts

Are maintained at - <https://test.uncefact.org/vocabulary/untp/dia/0/about>

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due in June 2025 after formal public review

Release for Pilot Testing

Version 0.6.0 release artifacts can be used for pilot testing.

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

- [JSON-LD @context](#)
- [JSON Schema](#)
- [Sample JSON Instance](#)

Ontology

The ontology for the Digital Identity Anchor is available in JSON-LD format and can be retrieved via content negotiation from:

<https://test.uncefact.org/vocabulary/untp/dia/0/>

Example:

```
curl https://test.uncefact.org/vocabulary/untp/dia/0/ -H 'Accept: application/ld+json'
```

Sample Credential

URL	QR	Description
Sample Digital Identity Anchor		A sample digital identity anchor as a JWT envelope signed Verifiable Credential. The URL (or QR scan) resolved to a hosted verifier that displays a human readable version. Raw JSON data can be viewed via the JSON tab and the full credential can be downloaded via the download button.

Version History

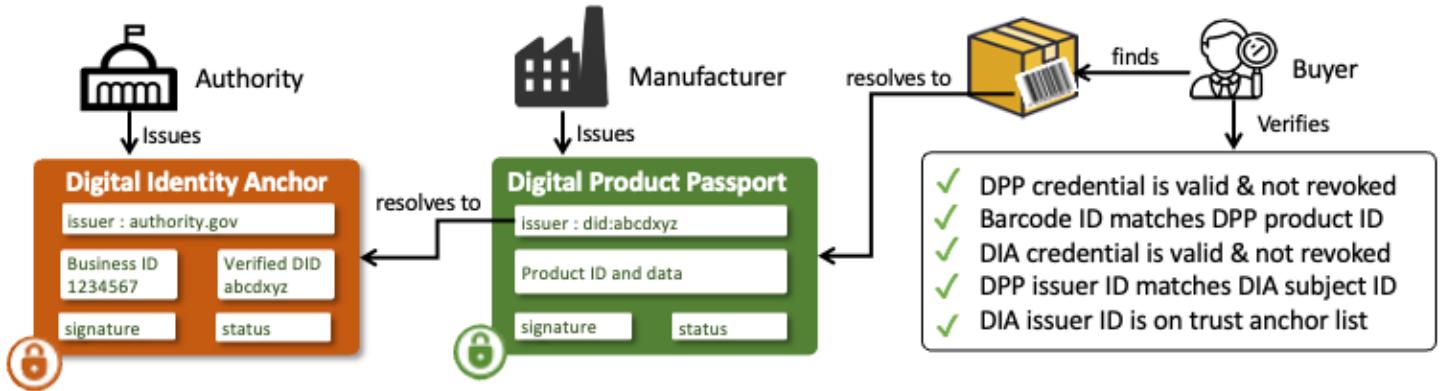
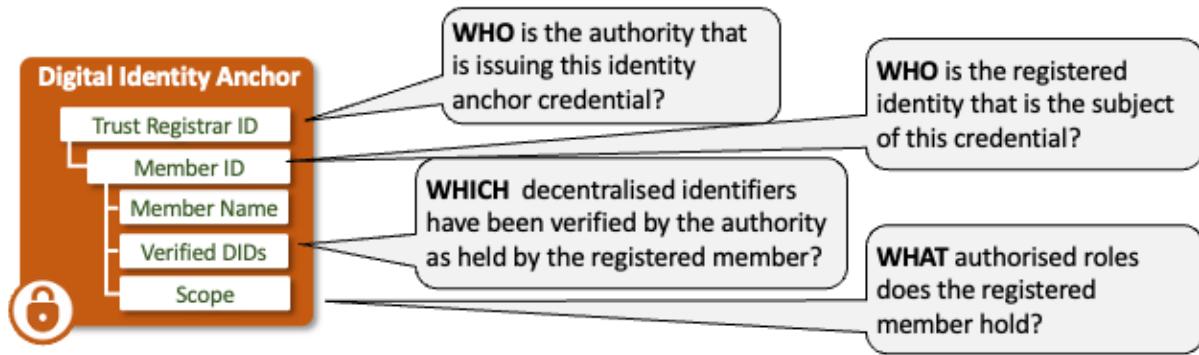
History of releases is available from the [Version history](#) page.

Overview

The Digital Identity Anchor (DIA) credential provides a simple means to verify the identity of UNTP credential issuers. The `issuer.id` property of all UNTP credentials is defined as a W3C decentralized identifier (DID) so that credentials like product passports can be cryptographically verified as genuinely issued by the issuer of the DID. But, as a self-issued identity, the DID does not provide confidence that the issuer is really who they claim to be. Authoritative identity registers such as national business registers, trademark registers, and land registers exist in most countries and have well established and trusted registration and maintenance processes. Unfortunately, most authoritative registers only issue paper or PDF registration certificates that are easily faked and are not usable for digitally verifiable proof of identity. The UNTP DIA is essentially a digitally verifiable version of a registration certificate. It is issued by the authoritative register to authenticated members when the member proves ownership of their DID to the register. When a DIA accompanies a UNTP credential such as a DPP, a verifier can confirm not only that the DPP was issued by the holder of the DID, but also that the controller of the DID is also the holder of the authoritative registered identity.

Conceptual Model

The Digital Identity Anchor (DIA) is a very simple credential that is issued by a trusted authority and asserts an equivalence between a member identity as known to the authority (eg a VAT number) and one or more decentralised identifiers (DIDs) held by the member. Before issuing the DIA, the authority should verify DID ownership (eg using [DID Auth](#)).



The outcome is that the subject of the DIA (eg the VAT registered business) can prove that they are the registered identity to any other party. In the UNTP context the DIA provides assurance that a DPP (or DCC/DFR/DTE) issuer really is who they say they are. The verification workflow is as follows

- A verifier (eg buyer of an identified product) discovers a DPP for the product and verifies the credential - confirming that the DPP has not been tampered-with, is genuinely issued by party identified by the issuer DID.
- The DID is resolvable to the DID document which contains a link to the DIA in the DID document `service` end point.
- Verify the DIA credential and confirm that the DPP issuer DID is the `credentialSubject.id` of the DIA.
- Confirm that the issuer `did:web` of the DIA (the authoritative register) is on the white list of trust anchors.

The DIA can also be used for similar trust anchoring purposes such as:

- Accreditation authorities issue DIA to assert that a conformity assessment body is accredited against a given scheme.
- IP Offices issue DIA to assert that a registered party is the genuine owner of a trademark.
- Land registers issue DIA to assert that a regulated party is the owner of a geo-located property.

Requirements

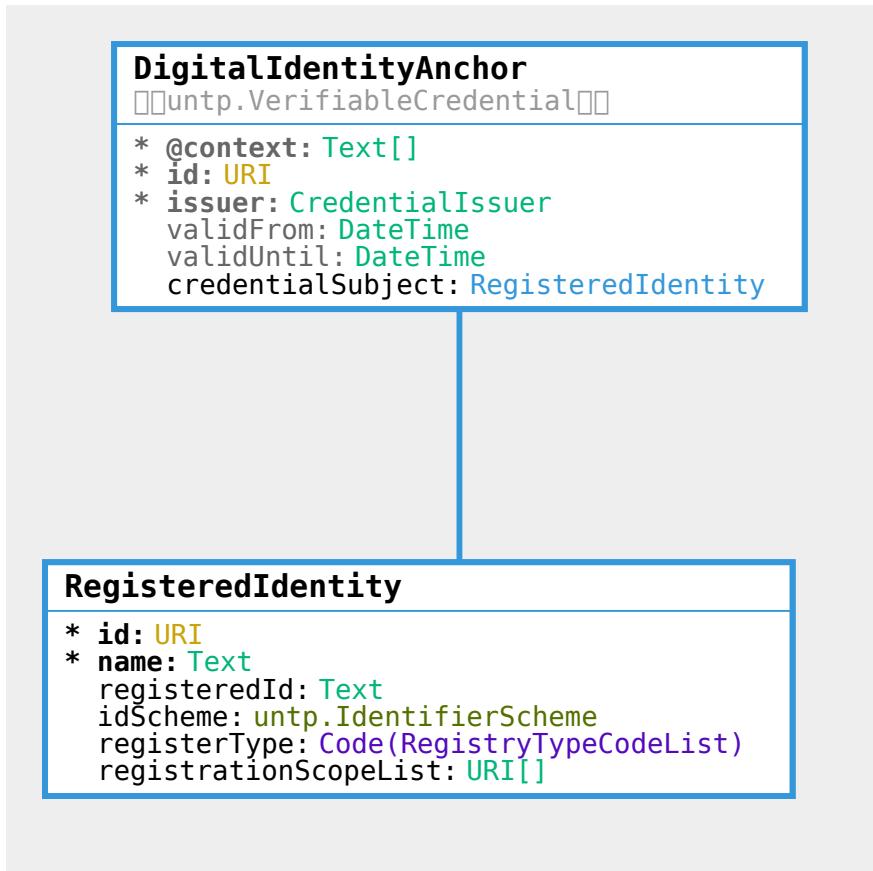
The digital identity anchor is designed to meet the following detailed requirements as well as the more general [UNTP Requirements](#)

ID	Name	Requirement Statement	Solution Mapping
DIA-01	DID Verification	The DIA issuer (registrar) MUST confirm that the registered member (subject) is the legitimate controller of a DID before issuing a DIA credential so that the registrar is protected against members falsely claiming ownership of well known DIDs	MAY use the DID Auth protocol for this purpose.
DIA-02	DIA Issuer DID	The DIA issuer MUST use did:web as the DIA issuer and the web domain MUST match the well known domain of the issuing authority so that verifiers can confirm authority identity via public web records.	DIA issuer specification
DIA-03	Scheme registration	The DIA issuing authority SHOULD register the identity scheme (including the trusted issuer DIDs) with the UN/CEFACT identifier scheme registry so that verifiers can leverage UN maintained scheme metadata to simplify DIA discovery and verification.	See UNTP Identity Resolver
DIA-04	Multiple DIDs	A registered member may need to link multiple DIDs to one registered ID, either because there is a need to transition between DID service providers or because an organisation may choose to use different DIDs for different purposes.	Issue multiple DIAs
DIA-05	Scope List	The DIA MUST include a list of scope URIs that unambiguously define the authorised role(s) of the member in the register so that verifiers can confirm the scope of the membership.	<code>registrationScopeList</code> property
DIA-06	Register Type	The DIA MUST specify the register type so that verifiers can understand the context of the <code>registrationScopeList</code>	<code>registerType</code> property
DIA-07	DIA Discovery	The DIA SHOULD be discoverable given either the DID or the registeredID	DIA Discovery
DIA-08	White list	The DIA should include a mechanism to avoid malicious actors who are not the registrar from issuing DIAs that claim links to authoritative registered IDs	Maintain white list of trusted issuer DIDs on UN/CEFACT identifier scheme registry

The examples below help to clarify the application of DIA-05 and DIA-06.

Logical Model

The Digital Identity Anchor logical model.



Core Vocabulary Documentation

The [UNTP core types vocabulary](#) defines the uniquely identified Linked Data entities such as Product, Location, Facility, Party, Standard, Regulation, Criteria, Declaration, Attestation, Endorsement. The Digital Identity Anchor only re-uses the UNTP core `VerifiableCredential` and `IdentifierScheme` classes.

DIA Documentation

The [DIA documentation](#) provides a technology-neutral definition of classes, properties and code lists in the DIA model.

Implementation Guidance

This section provides sample JSON-LD snippets for each DIA component.

Digital Identity Anchor

The Digital Identity Anchors is a Verifiable credential. Please refer to [DPP VC Guidance](#) for information about the use of the verifiable credentials data model for UNTP. The credential issuer of the VC MUST be the authority that owns or operates the

identity register.

Registered Identity

The registered identity class represents the registry member. For example, in a national business register, the registered identity would be one of the registered businesses.

- `type` MUST contain constant value array `["RegisteredIdentity"]` which declares to linked data processors that this is a registered identity.
- the `id` MUST contain DID of the registered member that is linked to the `registeredId` and for which the registrar has verified is controlled by the subject.
- `name` is the human readable registered entity name and SHOULD match the registered name as it appears in the authoritative register.
- `registeredId` contains the simple identifier value that is unique within the register (but may not be globally unique) for example the VAT registration number.
- `idScheme` identifies the authoritative register. If the identity scheme is registered with UN/CEFACT then the `idScheme.id` MUST match the `identityRegister.id` in the UN/CEFACT scheme register.
- `registerType` is a coded value that allows verifiers to distinguish between different DIA [use cases](#)
- `registrationScopeList` contains a list of URIs that define the scope of the member registration. The values are very specific to the register. For example a national business register would typically have a controlled vocabulary of entity types (eg [Australian Entity Types](#))

```
"credentialSubject": {
  "type": [
    "RegisteredIdentity",
  ],
  "id": "did:web:samplecompany.com/123456789",
  "name": "Sample business Ltd",
  "registeredId": "90664869327",
  "idScheme": {
    "type": [
      "IdentifierScheme"
    ],
    "id": "https://sample-register.gov",
    "name": "Sample National Business Register"
  },
  "registerType": "Business",
  "registrationScopeList": [
    "https://sample-register.gov/EntityType?Id=00019"
  ]
}
```

DIA Trust Anchors

The integrity of the DIA depends on verifiers knowing the authoritative list of authoritative registry issuer DIDs. Whilst it is possible for each verifier to maintain their own whitelist of trusted issuers, scalable global uptake would be facilitated if there is a UN maintained and trusted whitelist.

The data model for a UN maintained identifier scheme register is defined in the [Identity Resolver](#) specification and a prototype will be implemented for UNTP testing. A production implementation will require a new UN/CEFACT project proposal which will be submitted in due course.

DIA Discovery

DIA credentials SHOULD be discoverable from either identifier:

- Given a DID (eg as the issuer of a DPP) via DID document `service` endpoint.
- Given a registered identifier (eg a VAT registration number) via the ID scheme resolver service.

Via DID Service Endpoint

As described in the [W3C Decentralized Identifiers](#) specification, DIDs are resolvable to a DID document. The `service` property of a DID document contains an array of typed `serviceEndpoint` which can point to services or credentials relevant to the DID. A DID document may also contain an "alsoKnownAs" property which is typically used to reference other identifiers. Controllers of DIDs that are linked to authoritative register SHOULD

- Add the ID URI from the authoritative register to the `alsoKnownAs` list. In the snippet below `https://sample-register.gov/90664869327` has been added.
- Add proof that the relationship is reciprocal by adding a `service` object that references the DIA credential. In the example below, the DIA credential URL is `https://sample-credential-store.com/credentials/dia-90664869327.json`

```
{
  "id": "did:web:sample-business.com:123456789",
  "authentication": [{...}],
  ...
  "alsoKnownAs": ["https://sample-register.gov/90664869327"],
  "service": [
    {
      "id": "did:web:sample-business.com:123456789#90664869327",
      "type": "untp:dia"
      "serviceEndpoint": {
        "href": "https://sample-credential-store.com/credentials/dia-90664869327.json",
        "title": "Digital Identity Anchor",
        "type": "application/vc+jwt"
      }
    }
  ]
}
```

Via Identity Resolver

As described in the UNTP [Identity Resolver](#) specification, existing identity registers are encouraged to make their registered identities *resolvable* and *verifiable*.

- Identifiers are made *resolvable* by implementing [ISO-18975](#) to encode IDs as URLs and returning an IETF [rfc-9264](#) link-set with links to relevant further data about the ID.

- Identifiers are made *verifiable* by issuing DIAs per this specification.

This presents the opportunity to make the DIA discoverable by returning an appropriate link in the link-set. For example, given a VAT registration number `90664869327` issued under scheme `https://sample-register.gov` and applying the scheme resolver template may yield a resolver service URL of `https://resolver.sample-register.gov/vatNumber/90664869327`

The resolver service may be called with parameters that define which link-types to return. `https://resolver.sample-register.gov/vatNumber/90664869327?linkType=all` will return a linkset that SHOULD contain the DIA credential link (among other links such as the registration history) as follows.

```
{
  "linkset": [
    {
      "anchor": "https://resolver.sample-register.gov/vatNumber/90664869327",
      "untp:dia": [
        {
          "href": "https://sample-credential-store.com/credentials/dia-90664869327.json",
          "title": "Digital Identity Anchor",
          "type": "application/vc+jwt"
        }
      ]
    },
    {
      "anchor": "https://resolver.sample-register.gov/vatNumber/90664869327",
      "about": [
        {
          "href": "https://sample-register.gov/registrationHistory?id=90664869327",
          "title": "Registration History",
          "type": "text/html"
        }
      ]
    },
    ...
  ]
}
```

Alternatively, invoking the resolver service with the DIA specific link type `https://resolver.sample-register.gov/vatNumber/90664869327?linkType=untp:digitalIdentityAnchor` would redirect directly to the matching link

`https://sample-credential-store.com/credentials/dia-90664869327.json`

DIA Use Cases

This section provides some example use cases for the UNTP DIA credential for different authoritative registr types

Business Registers

TBC

Facility Registers

TBC

Trademark Registers

TBC

Accreditation Registers

TBC

Land Registers

TBC

Product Registers

TBC

Decentralised Access Control

! INFO

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Overview

There is a balance between the demands of transparency (more supply chain visibility means it's harder to hide green-washing) and confidentiality (share too much data and you risk exposing commercial secrets). A key UNTP principle is that every supply chain actor should be able to choose their own balance between transparency and confidentiality. To achieve this, UNTP defines data confidentiality patterns with different degrees of data protection so that they can be appropriately combined to meet the confidentiality goals of each party.

The ability to enforce access control to non-public data is a critical capability for any traceability and transparency framework. But when the non-public data is distributed across thousands of different systems and needs to be accessed by authorised parties previously unknown to the holder of the data, traditional access control systems will not work. A decentralised data architecture also needs a decentralised access control mechanism.

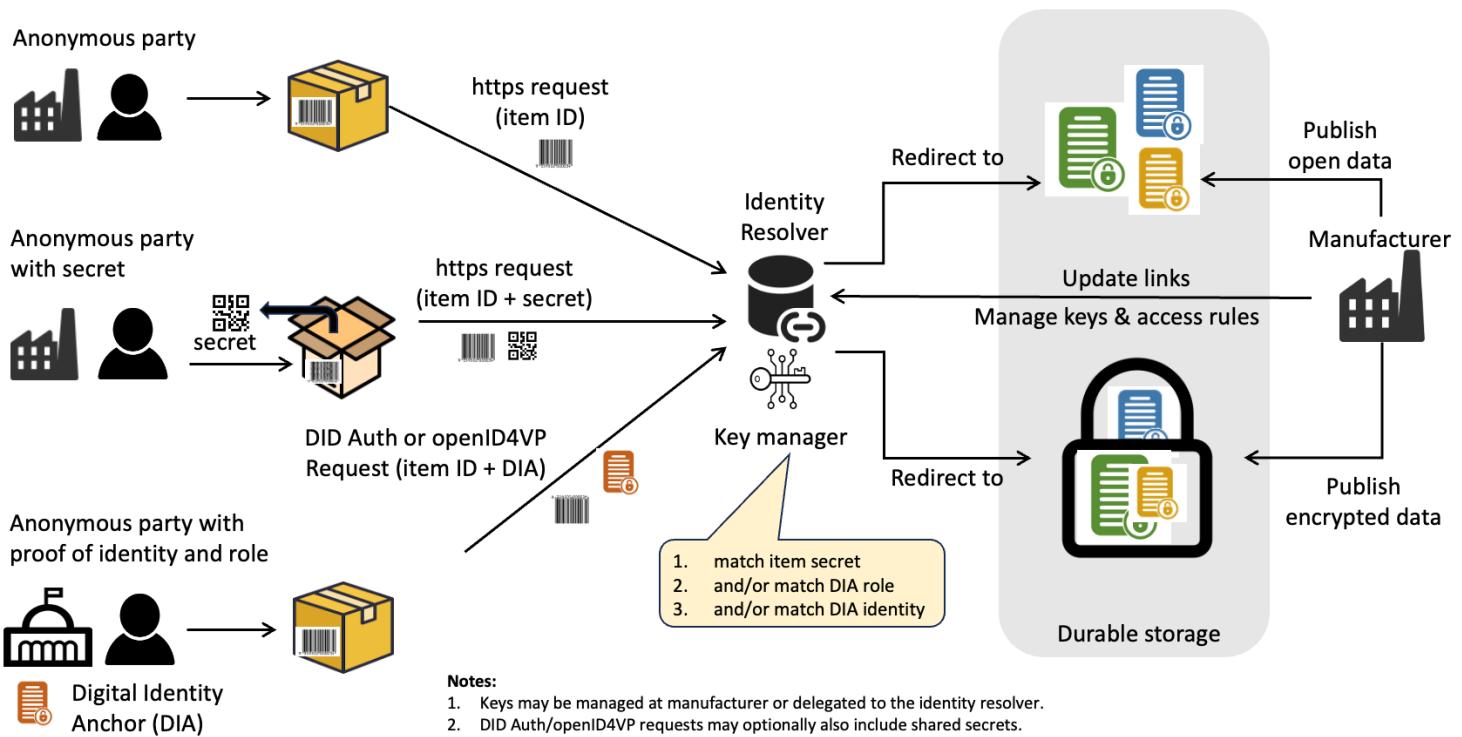
Conceptual Model

The conceptual model for decentralised access control is relatively simple. All non-public credentials are encrypted with a unique key for each credential. Access to encrypted data then boils down to the mechanism by which authorised parties acquire decryption keys from a data holder that may not know the requestor. There are only two ways to prove rights to encrypted data.

- 1. You already have the key:** The key is passed by the data holder to the data requestor by a separate channel. For example, to empower access to non-public data by the legitimate purchaser of the goods, the key could be located inside the packaging of the product.
- 2. You have a right to the key:** The key is made available to any data requestor that can prove their authorised role to the data holder via an authentication mechanism such as [DID Authentication](#).

Each uniquely identified item will have a unique encryption key. Therefore the keys provided by either of the above methods is usable only to decrypt the data about a single item. Similarly, for confidential data about products or facilities each will have its own unique encryption key.

Shared secrets and DID Authentication can be used in conjunction - for example a data holder may allow anonymous users to read non-public data with just a secret but may require both the secret (to prove item ownership) and DID Authentication (to confirm identity or role of the data requestor) to update item data.



The decryption of previously issued and encrypted verifiable credentials is preferred over any dynamic service because

- The same encrypted UNTP credential is used for both the shared secret and DID authentication access models.
- The access control is easily delegated to Identity Provider services and can continue to work even after the original issuer is no longer in business.

Requirements

- **data holder** is the party that created and maintains the information about a product or facility. Typically the product manufacturer or brand. The holder maintains both public and non-public data about the product or facility.
- **data requestor** is the party seeking access to product data held and maintained by the data holder.

ID	Name	Requirement	Solution Mapping
DAC-1	Anonymous access	As a data requestor that requires access to public product information, I should be able to access the information without any registration or identification - so that my privacy remains protected.	Anonymous public access
DAC-2	Access by legitimate owner	As the legitimate owner or user of a specific serialised item, I should be able to access non-public information such as usage and maintenance history about my item and also be able to update post-sale	Anonymous access with secret

ID	Name	Requirement	Solution Mapping
		life-cycle events without any need to register or identify myself to the data holder.	
DAC-3	Access with verifiable role	As an authorised actor such as an accredited recycling plant or a government authority, I should be able to access and update non-public product information according to my authorised role even if I am otherwise unknown to the data holder.	Decentralised authentication - role registrationScopeList property
DAC-4	Access with verifiable identity	As a known and trusted data requestor party I should be able to prove my identity to the data holder and be granted access according to my permissions.	Decentralised authentication - ID registeredId property or any federated identity protocol
DAC-5	Confidential supply	As a buyer who received credentials from my suppliers that provide confidence in the sustainability or quality of my upstream supply chain, I would like to pass on the sustainability or quality confidence to my customers without revealing the identity of my suppliers.	N-tier supplier visibility
DAC-6	Discoverability	As any data requestor that queries available data about a product or facility from an identity resolver service, I would like to understand not only what public data is available but also what confidential data is available and what evidence I need to provide to access the confidential data.	Discoverability of encrypted content
DAC-7	Durability	As a data requestor seeking information about a product or facility, I want to access the necessary data according to my role even if the original manufacturer is no longer in business and whether or not the data is open or confidential.	Durable storage options
DAC-8	Limit impact	The confidential data access scope associated with a specific secret key should be limited to one product or item so that the consequence of un-authorised access to confidential data minimised	Encryption granularity
DAC-9	Small footprint	Where space is tight (eg under a wine bottle cap) then a small format secret key option is available.	Secret key carrier

Decentralised Access Control

The simple matrix below will assist the reader to understand the context of the access control guidance and when to use each access model.

Security context	no secret key	access with secret key
no authentication	publicly discoverable data	item specific confidential data (eg service history) for the legitimate product owner
authenticated & authorised role	authorised role access to confidential data about multiple items (eg a customs authority)	authorised role access to specific item data only (eg repair facility update to item history) or facility level confidential data.

The following paragraphs provide guidance on how to secure data and grant access for various scenarios.

Anonymous public access

Anonymous access to public data is the default UNTP access pattern. It is already described in the [identity resolver](#) specification. From a security and resilience perspective, the only requirements are

- That data providers MUST NOT **require** personal identifying information from the data requestor as a condition of providing public information.
- That data SHOULD remain available for the lifetime of the product, irrespective of whether the original manufacturer still exists.

Both of these requirements are met using the [identity resolver](#) specification.

Item identifier as shared secret

Most item identifiers are relatively short numbers and are issued sequentially. So, for example, if <https://example.com/product/11223/serial/44556> is a known product and serial identifier then it is likely that the next serialised item ID could be <https://example.com/product/11223/serial/44557> or that the next product and serial in the range could be <https://example.com/product/11224/serial/00001>. When identifiers are easily guessed then information about the products is easily discovered even when the data requestor is not in possession of an actual product or serialised item.

However, if the product and serial numbers are issued as **genuinely random** large numbers then they become un-guessable and so any public (ie non-encrypted) data linked to the ID can be considered to be accessible only to the party in possession of the item. For example <https://example.com/product/11223/serial/44FDB2AFC91B898893CF36CB18863D26> is a product with a 32 character hexadecimal (128 bit) serial number and, provided the serial number is genuinely random, is computationally impractical to guess (1 billion guesses per second would still take many universe lifetimes).

Large random serial numbers are not common practice in industry and so are more likely to be considered for new rather than existing identifier schemes. However, depending on the sensitivity of the data, shorter serial numbers (eg <https://example.com/01/0952400005919/21/419A2845FD8050A0DD56>) may provide adequate confidentiality provided they are issued randomly and not sequentially. For example, if serial number `419A2845FD8050A0DD56` were one of a million serialised items of product ID `0952400005919` then it would still take a few years to guess one matching serial number at 1 billion guesses per second.

When non-guessable large identifiers are used as a security mechanism to access non-encrypted sensitive data, then;

- the access mechanism is no different to [anonymous public access](#).
- the identifiers MUST be **genuinely random** strings
- the data MUST NOT be index-able by search engines.
- the web repository that holds the data MUST NOT be searchable or expose lists of stored file.

Confidential data encryption

In many cases, relying on an un-guessable identifier is not possible or not sufficiently secure. In such cases, confidential data SHOULD be encrypted.

- Encryption MUST be done with a symmetric encryption algorithm such as [AES](#) with a minimum of 128 bit key length.
- Each distinct identified entity (i.e. facility, product, product batch, or serialised item with a unique IDR path) MUST use a separate and unique encryption key.
- Where there are multiple different authorised roles that require access to different non-public data then a unique encryption key SHOULD be used for each role.
- Where there are multiple non-public documents or credentials for a given unique entity and authorised role then they SHOULD be encrypted with the same key.

These encryption requirements will result in an optimal granularity of encryption where one or more encrypted objects about a specific item and for access by a specific authorised role are all encrypted with the same key. But data for other roles or other items are not accessible with the given key.

Decryption key as shared secret

When confidential data about serialised items is encrypted then decryption keys SHOULD be included with the product and be optimised for easy use.

- The key SHOULD be presented as a QR code (either included with the product or, for bulk/raw materials, sent separately)
- The code MUST resolve to an [Identity Resolver](#) query URL for the given item and with the symmetric key secret as a `key` parameter.
- For cases with limited space such as a QR under a wine bottle cap, implementers MAY use a shorter URL that redirects to the same full identity resolver URL. The short URL SHOULD include 128 bit entropy so that it is sufficiently un-guessable.

For example, for a 128 bit AES key in a query to a resolver about product ID 90664869327 that returns only encrypted link targets for anonymous access the resolver URL would be <https://resolver.product-register.com/01/90664869327?key=2b7e151628aed2a6abf7158809cf4f3c&accessRole=untp%3AaccessRole%23Anonymous>

Small footprint codes

A 128 bit short redirect URL (in capitals because that creates smaller QR codes) can be used for cases where there is limited space for QR codes. For example `HTTPS://REDIRECT.IO/E05778C659733E222758AC5179AE4611` could redirect to the same full URL `https://resolver.product-register.com/01/90664869327?`

`key=2b7e151628aed2a6abf7158809cf4f3c&accessRole=untp%3AaccessRole%23Anonymous`

The full and short URLs would produce the following QR codes

Full resolver URL	Short redirect URL
	

Federated authentication workflow

In some cases access to (and update of) confidential data requires more than a shared secret that proves ownership of a serialised item but also requires evidence that the data requestor has an authorised role such as a competent authority, a recycling plant, or accredited auditor. When the data requestor is already known and registered with the data provider then a conventional "sign-in-with" federated authentication and authorisation mechanism such as [OAuth 2.0](#) or [OIDC](#) can be used. UNTP does not impose any restrictions on how a data provider authenticates and authorises access to protected data for users that are already known to the provider.

However, these kind of protocols require a relying-party relationship between the data provider that requires evidence of identity (eg a product passport issuer) and an identity provider that is the manager of the identity (eg a regulatory authority). Although this "sign-in-with" protocol is easy to implement with social network identity providers who deliberately place low barriers to relying parties, more authoritative registers such as national business registers, land registers, trademark registers, and so on are much more conservative. They mostly either don't offer federated identity or even if they do, they are very restrictive about allowed relying parties.

Decentralised authentication workflow

Decentralised protocols provide a much simpler and more scalable authentication and authorisation approach for decentralised architectures that avoids any need for direct collaboration or dependencies between data providers and identity providers. For example, consider an access rule defined by a China based battery manufacturer that says "to update battery status to **recycled** the requestor must be an accredited recycling establishment operating in a recognized jurisdiction (eg Australia).

The workflow would be

- Australian recycling plant "Sample Recyclers" is accredited under the Australian Government Department of Environment **stewardship scheme** and has obtained a **Digital Identity Anchor** credential that links their DID to their government accreditation status.
- Sample Recyclers receives a battery for recycling after 7 years of use that was originally made by "China Batteries Sample Co". It has a serialised item specific QR secret printed on the battery.
- Sample Recyclers scans the QR (which includes presentation of the secret), receives a IDR link-set response that includes a UNTP standard link that defines an authenticated method and URL to add a recycled event to the battery history that requires evidence of accredited recycler status.
- Sample Recyclers authenticates to the specified endpoint using DID-Authentication and presents their Australian Government issued DIA credential as a verifiable presentation.
- China Sample Batteries Co verifies the presentation (which confirms DID control) and checks that the issuer (AU government) is on their trusted white-list, and then adds the recycled event to the item history.

Decentralised authentication protocol options.

UNTP does not define any new protocols for decentralised authentication but rather supports the use of any of the existing standards listed below.

- DID Auth specification link : <https://w3c-ccg.github.io/vp-request-spec/#did-authentication>
- DID SIOP specification link : https://openid.net/specs/openid-connect-self-issued-v2-1_0.html
- OID4VP specification link : https://openid.net/specs/openid-4-verifiable-presentations-1_0.html

Aspect	DID Authentication	DID-SIOP	OpenID4VP
Primary Purpose	DID-based authentication with credential integration	Decentralized login using OIDC	Credential presentation in OIDC
Workflow Complexity	Moderate	Moderate	Complex
OIDC Integration	No	Yes	Yes
Use Case Focus	Proving DID control with credential attachment	Decentralized login	Claim verification and presentation

The best choice will eventually be the specification(s) that demonstrate the widest market implementation. At this time, the UNTP recommendation is that implementers SHOULD use **DID-Authentication** but MAY also use either **DID-SIOP** or **OpenID4VP**.

Confidential data discovery

Identity resolvers MUST include information to indicate when a link target is encrypted. Resolvers MUST also provide information about how to POST update events, where appropriate.

- When a link target is encrypted, the `encryptionMethod` custom property MUST be included with a value drawn from the [UNTP encryption method code list](#).
- When a link target is encrypted, the `accessRole` custom property MUST be included. The allowed values are an array of URIs that will be used to match against `registrationScopeList` in digital identity anchor credentials.
- To indicate that access is allowed by any party that holds a secret key, the `accessRole untp:accessRole#Anonymous` MUST be included.
- To indicate that the link target is an update service, the `method": "POST"` property is required, together with the `accessRole` needed for the update to be accepted.

For example

```
{
  "linkset": [
    {
      "anchor": "https://resolver.product-register.com/01/90664869327",
      "https://vocabulary.uncefact.org/untp/linkType#digitalTraceabilityEvent": [
        {
          "href": "https://sample-credential-store.com/credentials/dte-90664869327.json",
          "title": "Battery maintenance event",
          "type": "application/ld+json",
          "lang": ["en"],
          "encryptionMethod": "AES-128",
          "accessRole": ["untp:accessRole#Anonymous"]
        },
        {
          "href": "https://api.sample-credential-store.com/credentials",
          "title": "Battery recycling event",
          "type": "application/ld+json",
          "lang": ["en"],
          "method": "POST",
          "accessRole": ["untp:accessRole#Recycler"]
        }
      ]
    }
  ]
}
```

Implementation Considerations

To do - add guidance relevant to decentralised access control for common concerns and use-cases.

Linked confidential data

Data about a value chain comprises multiple credentials about products and facilities in a linked-data graph. Any of the credentials in the graph may be considered confidential and therefore be protected by an appropriate access control method. This will present challenges for verifiers such as supply chain traceability systems that need to traverse long graphs for their customers. A typical scenario might work as follows:

- A verifier encounters a serialised product ID and performs an IDR lookup which returns a link-set which contains:
 - link to an un-encrypted Digital Product Passport (DPP) which also contains an ID of the facility that manufactured the item
 - links to an encrypted Digital Traceability Event (DTE) with "encryptionMethod": "AES-128" and "accessRole": ["untp:accessRole#Anonymous"] properties.
- The verifier has the secret key for the given item and so decrypts the DTE to find that it is a transformation event that lists the identifiers and quantities of input products.
 - For some of the input product ID, the verifier is able to resolve link-sets from relevant IDRs and access public data (eg DPPs) about the input products.
 - The input product IDR process also returns encrypted links but they cannot be decrypted because the verifier has no access to the secret key for supplier input products.
- The verifier resolves the facility ID found in the DPP to a new link-set that contains links to both public and private data about the facility.
 - A link to a public digital facility record (DFR) includes precise geo-location information as well as some public sustainability claims.
 - A set of links to facility level conformity credentials (DCC) that are encrypted and have "accessRole": ["untp:accessRole#Customer"] property. The verifier uses DID-Authentication to connect to the DCC end points and presents a Digital Identity Anchor (DIA) that proves the verifier ID which matches a facility customer list. Decryption keys are provided with a new link-set of the authorised customer.

In general, when a verifier hits a graph node that is encrypted and does not have access keys, then graph traversal cannot proceed beyond that node. Perhaps the most common scenario will be transformation events that reveal the input products (and suppliers) in a manufacturing process.

N-tier supplier visibility

To do - guidance about how to handle upstream product / supplier data that is considered sensitive. There are likely to be four "levels" of transparency that implementers may choose:

- Make it all public
- Make your suppliers visible only to your direct customers (eg if the ID in your DIA matches the destination party ID in a transaction event)
- Use a trusted third party to assess to your supply chain sustainability without revealing supplier identities - and issue a more public digital conformity credential that attests to qualities without identities.
- Make it all private and never share anything.

Durable storage

To do - write some words about how to manage protected data even after the supplier / publisher is no longer in business.

Sustainability Vocabulary Catalog

! INFO

Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Artefacts

Stable Releases For Implementation

Version 1.0 stable release for production implementation is due Jun 2025

Release for Pilot Testing

- Conformity Vocabulary [Schema](#) and [Documentation](#)
- Conformity Topic Classification [JSON Structure](#), [JSON-LD vocabulary](#)
- Conformity Scheme [Register](#) (simple web page for now)

Note that the vocabulary schema depends on definitions in [UNTP core vocabulary](#)

Latest Development Version

Latest development versions are used to reflect lessons learned from pilots but should not be used for either pilot testing or production purposes.

Version History

First release.

Sample Conformity Vocabulary

Will be published by early implementers and discoverable via the [scheme owner register](#)

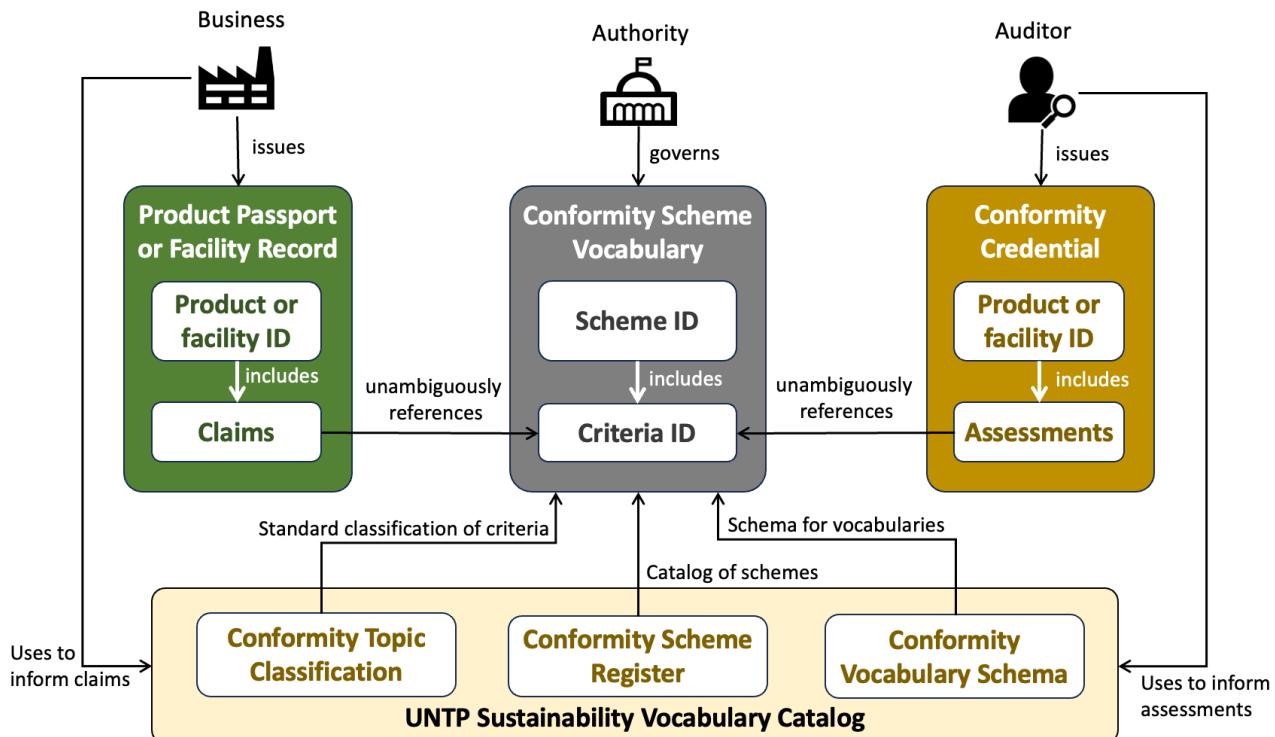
Overview

Web **vocabularies** are a means to bring consistent understanding of **meaning** to ESG claims and assessments throughout transparent value chains based on UNTP. There are hundreds of ESG standards and regulations around the world, each with dozens or hundreds of specific conformity **criteria**. Any given value chain from raw materials to finished product is likely to include dozens of passports and conformity credentials issued against any of thousands of ESG criteria. Without a consistent means to make sense of this data, UNTP would provide a means to discover a lot of data but no easy way to understand it. This specification provides guidance to scheme owners about how to publish their sustainability standards in a way that allows the conformity criteria defined by the standards to be unambiguously referenced when making claims and assessments.

Conceptual Model

The diagram shows how the sustainability vocabulary catalog works with UNTP credentials such as product passports, facility records, and conformity credentials to bring unambiguous meaning to sustainability claims and assessments.

- Schemes (Grey): There are hundreds of national regulations and industry standards that address sustainability of products, facilities, and organisations. Each one typically contains multiple auditable criteria. These are governed by the government or industry authorities that define them. UNTP does not seek to create any new schemes or regulations but rather to provide a means to ensure that these standards and regulations can be unambiguously referenced by digital credentials. This requires each individual criteria to have a globally unique identifier (a URI).
- DPP / DFR (green): The UNTP digital product passport (DPP) provides a means for a manufacturer or brand owner to list multiple sustainability claims for a given identified product. Similarly a UNTP digital facility record (DFR) provides the same capability but for facilities such as farms, mine-sites, processing plants, or manufacturing sites. Each claim may reference a sustainability criteria defined by a regulator or an industry standard.
- DCC (brown): The UNTP digital conformity credential (DCC) provides a means for a second or third party to list independent assessments of specific products or facilities against the same conformity criteria. For a DCC to verifiably support a claim in a DPP, the identifier of the criteria and supporting regulation / standard must match. Therefore it is important that both the manufacturer issuing the DPP and the auditor issuing the DCC use the same identifier for the sustainability criteria.



The purpose of the sustainability vocabulary catalog (SVC) is to reduce the risk of misalignment between claims in DPPs and assessments in DCCs and also to provide a way to group similar criteria across different schemes. The SVC has three components

- A standard structure (**schema**) for scheme owners to publish their vocabularies of conformity criteria. This makes sure that the criterion URI is **correct**.
- A catalog of schemes that can be used as the entry point to discover scheme-specific criteria. This makes sure that the criterion URI is **discoverable**.
- A conformity topic taxonomy that can be used to classify criteria from different schemes. This makes sure that different criterion URI are **comparable**.

Requirements

ID	Requirement Statement	Solution Mapping
SVC-01	As a scheme owner, I need to publish the granular conformity criteria defined by my scheme in such a way that each conformity criteria in a multi-level hierarchy can be unambiguously referenced by issuers of conformity credentials, facility records, and product passports	Conformity Vocabulary Schema
SVC-02	As a scheme owner, I need to manage versions of schemes to reflect changes in the criteria within a scheme so that claims and assessments can be understood within a	Conformity Vocabulary Schema

ID	Requirement Statement	Solution Mapping
	specific version context	
SVC-03	As a scheme owner, I need to be able to group criteria according to performance levels so that auditors and subjects can clearly understand which criteria must be met in order to reach a given performance level (score)	Conformity Vocabulary Publishing Guide
SVC-04	As a scheme owner, I need to be able to tag criteria with context labels such as commodity type or facility type so that a relevant subset of assessment criteria are easily identified for a given audit context.	Conformity Vocabulary Schema
SVC-05	As a Conformity Assessment Body (CAB) I need to be able to easily find criteria URI for any scheme so that I can correctly reference them in the assessments recorded in digital conformity credentials that I issue	Conformity Scheme Register
SVC-06	As a product owner or facility operator, I need to be able to easily find criteria URI for any scheme so that I can correctly reference them in the claims lists in the product passports and facility records that I issue.	Conformity Scheme Register
SVC-07	Given that there are hundreds of schemes each with hundreds of criteria, as consumer of any digital credentials I need the criteria from different schemes to be classified using a simple taxonomy so that I can more easily compare similar criteria (eg emissions intensity) across different schemes.	Conformity Criteria Topic Classification

Conformity Vocabulary Schema

The sustainability vocabulary publishing guide provides scheme owners with a best practice framework that can be used to publish their schemes as a hierarchy of criteria, each with a unique identifier (URI). This is a critical activity so that issuers of product passports, conformity credentials, and facility records, can unambiguously reference a conformity criterion. In the example above the key reference criterion is "id": id":

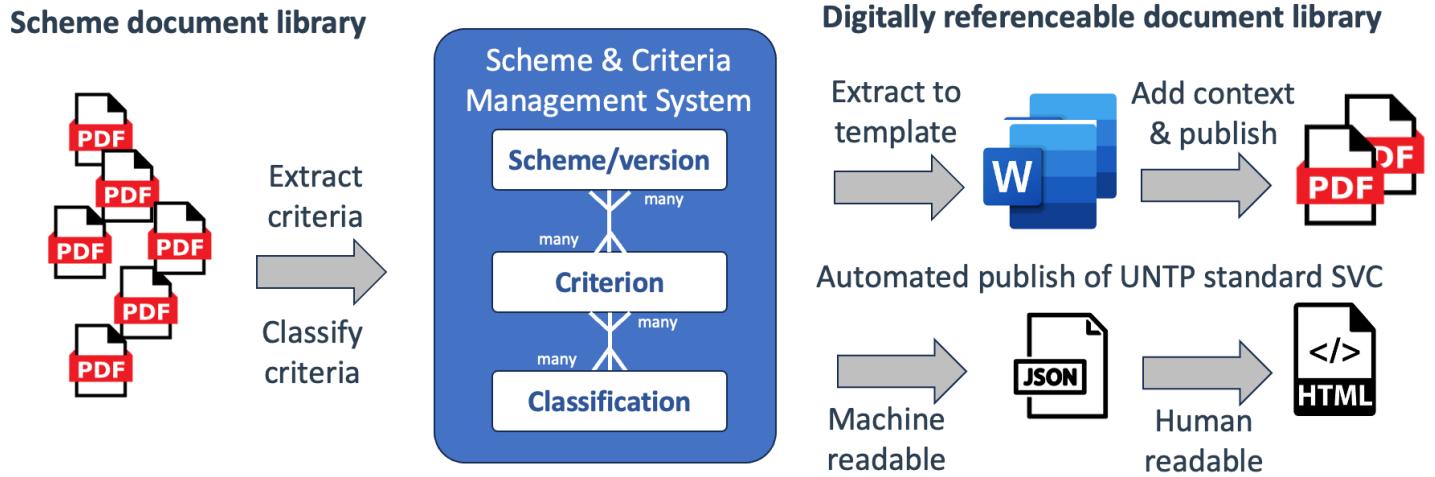
"https://www.globalbattery.org/GHGRulebook/2.0/GHG_Calculation" indicating that the claim is made following GHG Calculation guidance in the GBA v2.0 rulebook.

Minimum Implementation

At a minimum, scheme owners need to specify a URL for each conformity criterion that will be referenced by a claim or assessment. Scheme owners that already publish schemes and assessment criterion as a website with stable links may register their schemes with no further action. Scheme owners without reference-able criteria URIs (or who wish to upgrade their digital publishing) should follow the guidance below.

Implementation Guidance

To publish a UNTP SVC compliant vocabulary, scheme owners will need to published conformity criteria as a web vocabulary alongside existing publishing formats (typically PDF documents). For some scheme owners that already operate a system to manage scheme and criteria in a structured way, this could be just a simple publishing step from existing structured data. Other may choose to implement a "scheme management system" so that criteria are managed in one place and can be published in different formats. The diagram below shows a conceptual implementation model for any scheme owner.

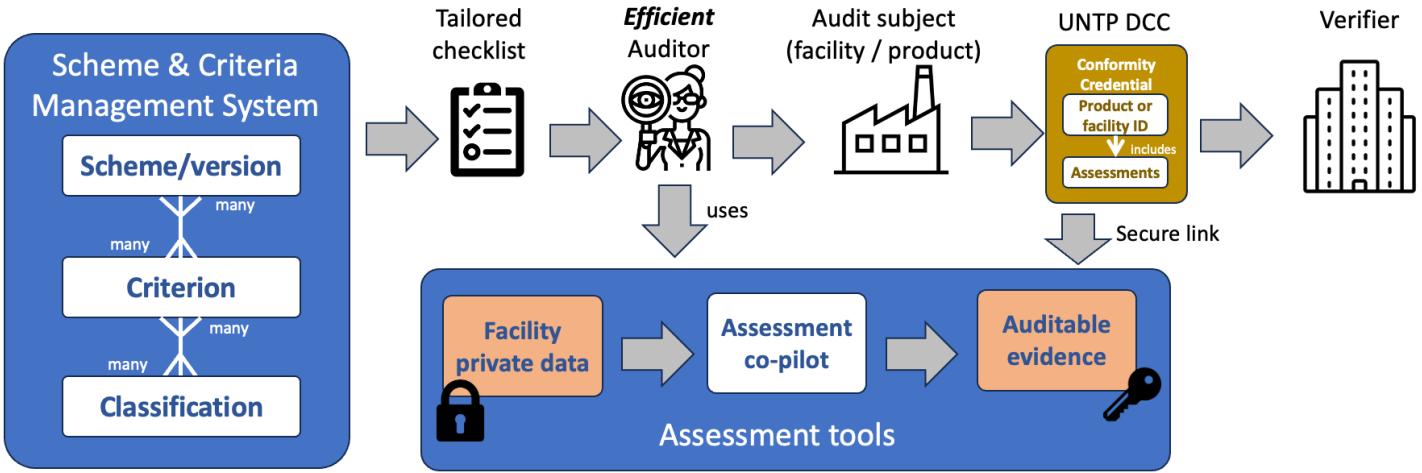


The implementation model proposes that scheme owners

- Create a lightweight system to maintain scheme versions, the conformity criteria within the scheme, and the classification of the criteria.
- Populate the system from existing scheme documentation, possibly with the assistance of some automation tools.
- Publish both the UNTP standard vocabulary catalog and relevant document content from the same system.

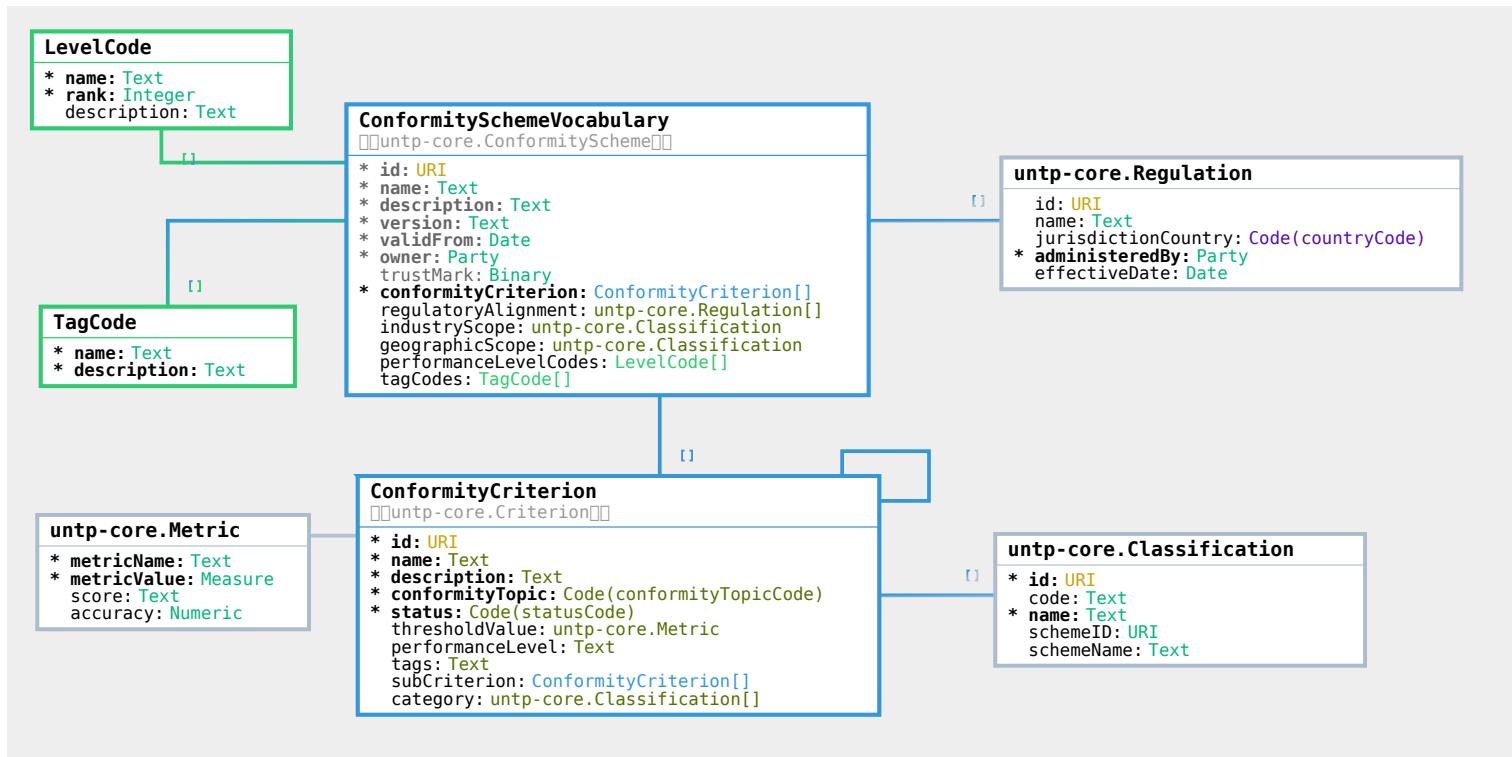
Once scheme and criteria are managed in a more structured way, scheme owners can potentially leverage the system to realise further benefits.

- Tailored auditor checklists are easily generated, reflecting the specific criteria applicable to the context of a specific product or facility subject.
- Automated assistants can more easily make initial assessments based on documentary evidence from the subject product or facility.
- The structured assessment together with secure links to evidence is already available, making the job of issuing a UNTP digital conformity credential very straightforward.



Logical Model

This section describes the logical data model of the scheme and criteria in more detail.



Model Documentation

The key ideas in the logical model of a published conformity vocabulary are

- A conformity scheme has a unique ID, a version, validity period, an owner, and contains a structured hierarchy of conformity criteria.
- The conformity scheme may define performance levels against which criteria can be categorised. It may also define an allowed set of tags which can be assigned to criteria for the purposes of filtering or sorting.
- A conformity scheme may reference any regulations that it is designed to support.

- Each criterion has a unique ID (a URI) which is the key reference for any claims or assessments of product or facilities made in product passports or conformity credentials.
- Each criterion must be classified according to the UNTP Conformity Topic Classification.
- A criterion may specify a threshold value as a numeric (eg 300Mpa tensile strength) or a score (eg "B") which an assessed product or facility must achieve in order to be considered conformant.
- A criterion may be classified according to formal classification schemes (eg applicable industry sector or commodity type).
- Criterion may list sub-criterion that specify more granular conformity requirements.
- A given criterion ID may be re-used by multiple Scheme ID (for example a Scheme version increments but most of the conformity criteria don't change from one version to the next).

Sample Scheme Vocabulary

The JSON snippet below shows an example of a Scheme and criteria as a UNTP compliant digital vocabulary. Such data structures should be simple to generate from a scheme management system. An HTML rendering template can present the same data as a human browsable website where there is a dedicated web page for each criteria ID (eg <https://sample-scheme.org/ESGStandard/S11>) that represents the detailed information about that criteria.

```
{
  "@context": {
    "untp-svc": "https://test.uncefact.org/vocabulary/untp/svc/working/",
    "untp-core": "https://test.uncefact.org/vocabulary/untp/core/0/",
    "xsd": "http://www.w3.org/2001/XMLSchema#"
  },
  "@id": "https://sample-scheme.org/ESGStandard/v4.0",
  "@type": "untp-svc:ConformitySchemeVocabulary",
  "name": "Sample ESG Standard",
  "description": "The Sample ESG Standard provides a framework for assessing and enhancing environmental, social, and governance performance across supply chains, ensuring compliance with best practices through validated assessments.",
  "version": "1.0.0",
  "validFrom": "2025-01-01",
  "owner": {
    "@id": "https://sample-scheme.org",
    "@type": "untp-core:Party",
    "registeredId": "SAMPLE-987654321",
    "idScheme": "https://www.example.org/registry",
    "registrationCountry": "US",
    "organisationWebsite": "https://www.sample-scheme.org"
  },
  "trustMark": "Sample ESG Certified",
  "conformityCriterion": [
    {
      "@id": "https://sample-scheme.org/ESGStandard/S1",
      "@type": "untp-svc:ConformityCriterion",
      "name": "Forced labour",
      "description": "Organizations shall ensure that all labor is voluntary, prohibiting any form of coerced or involuntary work, and shall not impose restrictions on employees' freedom of movement within or outside work premises.",
      "conformityTopic": "social.labour",
      "status": "active",
      "subCriterion": [
        {
          "@id": "https://sample-scheme.org/ESGStandard/S1/C1",
          "@type": "untp-svc:SubCriterion",
          "name": "Prohibition of child labour",
          "description": "Organizations shall prohibit the use of child labour in their operations and supply chain, ensuring that children under the minimum age are not employed in any capacity that poses a risk to their health, safety, or well-being."}
      ]
    }
  ]
}
```

```
{
  "@id": "https://sample-scheme.org/ESGStandard/S1.1",
  "@type": "untp-svc:ConformityCriterion",
  "name": "Voluntary agreements",
  "description": "Employment must be based on voluntary agreements, allowing employees to terminate their contracts with reasonable notice not exceeding one month.",
  "conformityTopic": "social.labour",
  "status": "active"
},
{
  "@id": "https://sample-scheme.org/ESGStandard/S1.2",
  "@type": "untp-svc:ConformityCriterion",
  "name": "Unrestricted access",
  "description": "Employees shall have unrestricted access to essential facilities such as restrooms and drinking water during working hours.",
  "conformityTopic": "social.labour",
  "status": "active"
}
],
},
{
  "@id": "https://sample-scheme.org/ESGStandard/S2",
  "@type": "untp-svc:ConformityCriterion",
  "name": "Workplace safety",
  "description": "Organizations shall identify and mitigate workplace hazards to ensure a safe working environment, providing necessary protective equipment to employees at no cost.",
  "conformityTopic": "social.safety",
  "status": "active"
},
{
  "@id": "https://sample-scheme.org/ESGStandard/E1",
  "@type": "untp-svc:ConformityCriterion",
  "name": "Environmental permits",
  "description": "Organizations shall secure and maintain all necessary environmental permits and adhere to reporting obligations to minimize environmental impact.",
  "conformityTopic": "environment.waste",
  "status": "active"
},
{
  "@id": "https://sample-scheme.org/ESGStandard/G1",
  "@type": "untp-svc:ConformityCriterion",
  "name": "Ethical governance",
  "description": "Organizations shall maintain high ethical standards, prohibiting bribery, corruption, or any unethical advantages in business dealings.",
  "conformityTopic": "governance.ethics",
  "status": "active"
},
{
  "@id": "https://sample-scheme.org/ESGStandard/G2",
  "@type": "untp-svc:ConformityCriterion",
  "description": "Organizations shall implement due diligence processes to ensure responsible sourcing of critical raw materials, aligning with international guidelines.",
  "name": "Supply chain due diligence",
  "conformityTopic": "governance.compliance",
  "status": "active",
  "thresholdValue": {
    "metricName": "Percentage of Critical Materials with Due Diligence",
    "metricValue": {
      "value": 75,
      "unit": "P1" // UNECE code for percentage
    }
  }
}
```

```
        }
    }
],
"regulatoryAlignment": [
{
    "@id": "https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C029",
    "@type": "untp-core:Regulation",
    "jurisdictionCountry": "UN",
    "administeredBy": {
        "@id": "https://www.ilo.org",
        "@type": "untp-core:Party",
        "registeredId": "ILO-UN",
        "idScheme": "https://www.un.org/en/about-us/un-system"
    },
    "effectiveDate": "1932-05-01"
},
{
    "@id": "https://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals",
    "@type": "untp-core:Regulation",
    "jurisdictionCountry": "OECD",
    "administeredBy": {
        "@id": "https://www.oecd.org",
        "@type": "untp-core:Party",
        "registeredId": "OECD-INT",
        "idScheme": "https://www.oecd.org/about/"
    },
    "effectiveDate": "2011-05-25"
}
],
"performanceLevelCodes": [
{
    "@type": "untp-svc:performanceLevelCodes",
    "name": "Critical",
    "rank": 1,
    "description": "Indicates a severe non-conformance requiring immediate action and follow-up assessment."
},
{
    "@type": "untp-svc:performanceLevelCodes",
    "name": "Significant",
    "rank": 2,
    "description": "Indicates a notable non-conformance requiring corrective measures within a defined period."
},
{
    "@type": "untp-svc:performanceLevelCodes",
    "name": "Minor",
    "rank": 3,
    "description": "Indicates a less critical non-conformance requiring improvement but not urgent action."
}
],
"tagCodes": [
{
    "@type": "untp-svc:tagCodes",
    "name": "Manufacturing",
    "description": "Criteria applicable to manufacturing industries."
},
{
```

```

    "@type": "untp-svc:tagCodes",
    "name": "SupplyChain",
    "description": "Criteria targeting supply chain stakeholders."
}
]
}

```

Conformity Scheme Register

The conformity scheme register is essentially a catalog of schemes that are registered with UNTP by scheme owners. The register will evolve from a simple list to a rich criteria search capability as UNTP matures.

- The first (current) version is the current [Scheme Owners](#) registration page.
- The next version will add a structured data version of register and include more meta-data about each scheme and links to each scheme's published vocabulary catalog. Essentially a navigable and searchable version of registered schemes and their detailed criterion. When schemes are published by scheme owners in a structured way and criteria are classified [by conformity topic](#), the register will support cross-scheme queries such as "show me all criterion in the water conservation category"
- Future versions may include capabilities to define relationships between schemes and their criteria such as mutual recognition.

Conformity Topic Classification

Below is a **very early draft** of a 2-level ESG classification scheme for sustainability criteria and including references to the **EU Ecodesign for Sustainable Products Regulation (ESPR)**, **UN Sustainable Development Goals (SDGs)**, and **OECD Guidelines for Multinational Enterprises**. The taxonomy includes 8 top-level categories, each with 8-12 second-level categories, ensuring coverage of quality, safety, and sustainability criteria.

This classification is an early draft for discussion **only**. It is likely to evolve considerably until consensus is reached.

Machine Readable Versions

- [JSON Structure](#)
- [JSON-LD vocabulary](#)

Human Readable Version

Top-Level Category 1: Ecological Resilience

- **Description:** Emphasizes environmental protection, resource conservation, and climate resilience.
- **Mappings:** UN SDGs (6, 7, 12, 13, 14, 15); OECD Guidelines (Chapter VI: Environment).
- **Second-Level Categories:**

- i. **Carbon Footprint Reduction** (SDG 13) - Minimizing greenhouse gas emissions (e.g., EU ESPR Art. 5 - Environmental Sustainability, UNTP environment.emissions).
- ii. **Renewable Energy Use** (SDG 7) - Transition to sustainable energy sources (e.g., EU ESPR Art. 7 - Energy Efficiency, UNTP environment.energy).
- iii. **Water Conservation** (SDG 6) - Sustainable water management (e.g., EU ESPR Annex I - Water Use, UNTP environment.water).
- iv. **Waste Minimization** (SDG 12) - Reducing waste generation (e.g., EU ESPR Art. 6 - Waste Prevention, UNTP environment.waste).
- v. **Ecosystem Preservation** (SDG 15) - Protecting biodiversity (e.g., EU ESPR Annex I - Biodiversity Impact, UNTP environment.biodiversity).
- vi. **Forest Conservation** (SDG 15) - Preventing deforestation (e.g., EU ESPR Art. 5 - Resource Use, UNTP environment.deforestation).
- vii. **Recycled Material Integration** (SDG 12) - Use of secondary materials (e.g., EU ESPR Art. 8 - Recycled Content, UNTP circularity.content).
- viii. **Sustainable Product Design** (SDG 12) - Design for circularity (e.g., EU ESPR Art. 5 - Durability and Recyclability, UNTP circularity.design).
- ix. **Chemical Safety** (SDG 12) - Restriction of hazardous substances (e.g., EU ESPR Annex I - Substance Restrictions).

Top-Level Category 2: Human Equity and Welfare

- **Description:** Focuses on human rights, fair labor, and community support.
- **Mappings:** UN SDGs (1, 3, 4, 5, 8, 10); OECD Guidelines (Chapter IV: Human Rights, Chapter V: Employment and Industrial Relations).
- **Second-Level Categories:**
 - i. **Rights and Equality** (SDG 10) - Ensuring non-discrimination (e.g., EU ESPR Art. 10 - Social Sustainability, UNTP social.rights).
 - ii. **Decent Work Conditions** (SDG 8) - Fair wages and hours (e.g., EU ESPR Annex I - Supply Chain Due Diligence, UNTP social.labour).
 - iii. **Workplace Safety** (SDG 3) - Protecting worker health (e.g., EU ESPR Art. 10 - Social Impact, UNTP social.safety).
 - iv. **Community Empowerment** (SDG 1) - Supporting local development (e.g., EU ESPR Art. 10 - Stakeholder Engagement, UNTP social.community).
 - v. **Worker Representation** (SDG 8) - Freedom of association (e.g., EU ESPR Annex I - Labor Rights).
 - vi. **Forced Labor Elimination** (SDG 8) - Preventing exploitation (e.g., EU ESPR Art. 10 - Human Rights Due Diligence).
 - vii. **Youth Protection** (SDG 8) - Safeguarding young workers (e.g., EU ESPR Annex I - Child Labor Ban).
 - viii. **Gender Equity** (SDG 5) - Promoting diversity (e.g., EU ESPR Art. 10 - Social Sustainability).

Top-Level Category 3: Ethical Governance

- **Description:** Promotes integrity, accountability, and transparent practices.
- **Mappings:** UN SDGs (16); OECD Guidelines (Chapter II: General Policies, Chapter VII: Combating Bribery).
- **Second-Level Categories:**
 - i. **Anti-Corruption Measures** (SDG 16) - Preventing bribery (e.g., EU ESPR Art. 11 - Governance Requirements, UNTP governance.ethics).

- ii. **Open Reporting** (SDG 16) - Transparent ESG disclosures (e.g., EU ESPR Art. 12 - Information Requirements, UNTP governance.transparency).
- iii. **Legal Compliance** (SDG 16) - Adhering to regulations (e.g., EU ESPR Art. 4 - Compliance Obligations, UNTP governance.compliance).
- iv. **Responsible Procurement** (SDG 16) - Ethical supply chains (e.g., EU ESPR Art. 10 - Supply Chain Responsibility).
- v. **Stakeholder Inclusion** (SDG 16) - Engaging affected parties (e.g., EU ESPR Art. 10 - Stakeholder Dialogue).
- vi. **Data Privacy** (SDG 16) - Protecting personal information (e.g., EU ESPR Art. 12 - Digital Product Passport).
- vii. **IP Protection** (SDG 16) - Respecting intellectual property (e.g., EU ESPR Art. 11 - Governance Standards).
- viii. **Competitive Fairness** (SDG 16) - Ensuring fair market practices (e.g., EU ESPR Art. 11 - Governance).

Top-Level Category 4: Product Integrity

- **Description:** Ensures products are safe, reliable, and sustainable.
- **Mappings:** UN SDGs (9, 12); OECD Guidelines (Chapter VIII: Consumer Interests).
- **Second-Level Categories:**
 - i. **Product Safety Standards** (SDG 12) - Ensuring consumer safety (e.g., EU ESPR Art. 5 - Safety Requirements, UNTP social.safety).
 - ii. **Quality Performance** (SDG 9) - Meeting performance specs (e.g., EU ESPR Art. 5 - Performance Standards).
 - iii. **Substance Control** (SDG 12) - Banning harmful materials (e.g., EU ESPR Annex I - Substance Restrictions).
 - iv. **Product Longevity** (SDG 12) - Enhancing durability (e.g., EU ESPR Art. 5 - Durability, UNTP circularity.design).
 - v. **Standards Adherence** (SDG 9) - Compliance with certifications (e.g., EU ESPR Art. 4 - Ecodesign Requirements).
 - vi. **Supply Chain Traceability** (SDG 12) - Tracking origins (e.g., EU ESPR Art. 12 - Digital Product Passport, UNTP governance.transparency).
 - vii. **Consumer Information** (SDG 12) - Clear labeling (e.g., EU ESPR Art. 7 - Information Obligations).
 - viii. **End-of-Life Management** (SDG 12) - Effective recycling processes (e.g., EU ESPR Art. 6 - End-of-Life Requirements).

Top-Level Category 5: Circular Value Chains

- **Description:** Advances sustainability throughout supply and production networks.
- **Mappings:** UN SDGs (8, 12, 17); OECD Guidelines (Chapter II: General Policies, Chapter VI: Environment).
- **Second-Level Categories:**
 - i. **Ethical Material Sourcing** (SDG 12) - Sustainable raw materials (e.g., EU ESPR Art. 10 - Supply Chain Due Diligence, UNTP governance.transparency).
 - ii. **Supplier Sustainability** (SDG 17) - ESG compliance in supply (e.g., EU ESPR Art. 10 - Supply Chain Responsibility).
 - iii. **Resource Circularity** (SDG 12) - Reuse and recycling (e.g., EU ESPR Art. 8 - Recycled Content, UNTP circularity.content).
 - iv. **Energy Optimization** (SDG 7) - Efficient supply chain energy use (e.g., EU ESPR Art. 7 - Energy Efficiency).
 - v. **Supply Chain Labor Rights** (SDG 8) - Fair worker treatment (e.g., EU ESPR Annex I - Labor Standards).
 - vi. **Origin Tracking** (SDG 12) - Transparent supply chains (e.g., EU ESPR Art. 12 - Digital Product Passport).
 - vii. **Supplier Development** (SDG 17) - Building supplier capacity (e.g., EU ESPR Art. 10 - Supply Chain Support).
 - viii. **Supply Chain Risk Reduction** (SDG 12) - Mitigating vulnerabilities (e.g., EU ESPR Art. 10 - Risk Management).

Top-Level Category 6: Economic Sustainability

- **Description:** Balances profitability with sustainable economic impact.
- **Mappings:** UN SDGs (8, 9); OECD Guidelines (Chapter II: General Policies).
- **Second-Level Categories:**
 - i. **Business Resilience** (SDG 8) - Long-term profitability (e.g., EU ESPR Art. 11 - Governance for Sustainability).
 - ii. **Sustainable Investment** (SDG 9) - Funding green initiatives (e.g., EU ESPR Art. 5 - Resource Efficiency).
 - iii. **Green Innovation** (SDG 9) - Developing sustainable tech (e.g., EU ESPR Art. 5 - Innovation Requirements).
 - iv. **Employment Opportunities** (SDG 8) - Job creation (e.g., EU ESPR Art. 10 - Social Impact).
 - v. **Regional Economic Growth** (SDG 8) - Supporting local economies (e.g., EU ESPR Art. 10 - Community Benefits, UNTP social.community).
 - vi. **Resource Efficiency** (SDG 8) - Cost-effective resource use (e.g., EU ESPR Art. 7 - Efficiency Standards).
 - vii. **Economic Risk Management** (SDG 8) - Assessing financial risks (e.g., EU ESPR Art. 11 - Governance).
 - viii. **Supply Network Strength** (SDG 9) - Enhancing value chain stability (e.g., EU ESPR Art. 10 - Supply Chain Resilience).

Top-Level Category 7: Health and Safety Assurance

- **Description:** Prioritizes health and safety for workers and communities.
- **Mappings:** UN SDGs (3); OECD Guidelines (Chapter V: Employment and Industrial Relations).
- **Second-Level Categories:**
 - i. **Workplace Hazard Control** (SDG 3) - Reducing risks (e.g., EU ESPR Art. 10 - Social Sustainability, UNTP social.safety).
 - ii. **Emergency Readiness** (SDG 3) - Preparedness plans (e.g., EU ESPR Annex I - Safety Measures).
 - iii. **Exposure Management** (SDG 3) - Controlling harmful agents (e.g., EU ESPR Annex I - Substance Safety).
 - iv. **Living Conditions** (SDG 3) - Safe worker accommodations (e.g., EU ESPR Art. 10 - Worker Welfare).
 - v. **Healthcare Access** (SDG 3) - Providing medical support (e.g., EU ESPR Art. 10 - Health Provisions).
 - vi. **Well-Being Support** (SDG 3) - Addressing mental health (e.g., EU ESPR Art. 10 - Social Impact).
 - vii. **Nutrition Standards** (SDG 3) - Ensuring safe food provisions (e.g., EU ESPR Art. 10 - Worker Welfare).
 - viii. **Ergonomic Design** (SDG 3) - Safe physical work environments (e.g., EU ESPR Art. 5 - Product Safety).

Top-Level Category 8: Systemic Sustainability

- **Description:** Establishes frameworks for managing and improving ESG outcomes.
- **Mappings:** UN SDGs (12, 16); OECD Guidelines (Chapter II: General Policies).
- **Second-Level Categories:**
 - i. **Sustainability Policies** (SDG 16) - Formal ESG commitments (e.g., EU ESPR Art. 11 - Governance Framework).
 - ii. **Risk Identification** (SDG 12) - Assessing ESG risks (e.g., EU ESPR Art. 10 - Due Diligence).
 - iii. **Outcome Tracking** (SDG 12) - Monitoring performance (e.g., EU ESPR Art. 12 - Reporting Requirements).
 - iv. **Capacity Building** (SDG 12) - Training stakeholders (e.g., EU ESPR Art. 10 - Stakeholder Support).
 - v. **Process Enhancement** (SDG 12) - Continuous improvement (e.g., EU ESPR Art. 5 - Performance Improvement).
 - vi. **Feedback Channels** (SDG 16) - Grievance mechanisms (e.g., EU ESPR Art. 10 - Stakeholder Engagement).
 - vii. **Compliance Verification** (SDG 16) - Audits and checks (e.g., EU ESPR Art. 4 - Compliance Monitoring).

viii. **Transparent Communication** (SDG 16) - Public ESG reporting (e.g., EU ESGR Art. 12 - Information Disclosure, UNTP governance.transparency).

Best Practices

! INFO

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Design patterns are non-normative but provide best practice guidance for UNTP implementers.

Trust Graphs

The ESG footprint of a finished product is the aggregation of its components and processes through the value chain. Verification of ESG claims therefore involves assessing a bundle of linked credentials (aka a "trust graph") drawn from all or part of a value chain. Whilst each credential may be valid in its own right, one challenge is verifying the context of related credentials. For example, a conformity assessment body that is accredited to test strength of structured steel might not be accredited to issue emissions intensity certificates. A technically valid emissions certificate linked to a technically valid accreditation certificate that has a different scope would be fraudulent. To address this problem, the UNTP defines a simple method to verify the contextual scope of linked credentials. Essentially this provides a mechanism to verify a linked graph of data at a layer above individual credential verification.

Data Carriers

Digital data needs to be linked to the physical product it describes and should be discoverable through the identifiers printed on that product serial or batch number. For high volume goods and easy / reliable discovery, these identifiers are already typically represented as barcodes, matrix codes, QR codes, or RFID encoded data. UNTP supports the use of these existing data carriers. A basic UNTP principle is that if you have a product then you should be able to find ESG data about that product even when the identifier is not a web link. Therefore, the UNTP defines a generalised protocol to allow any identifier scheme to be consistently resolvable so that product passports and other data can always be accessed from the identifier of the product. The UNTP also defines a specific QR based data carrier format for use on paper/PDF versions of conformity credentials or other trade documents that provides secure access to credentials in a way that is both human and machine readable. This provides a simple but powerful mechanism to facilitate uptake of digital solutions alongside existing paper/PDF based frameworks.

Anti-Counterfeiting

As the value of genuinely sustainable goods increases, so do the incentives to sell fake goods as the real thing. UNTP defines a simple and decentralised anti-counterfeiting protocol that can be implemented by any producer at very low cost. It builds upon the W3C DID standard by issuing a unique DID (and corresponding keypair) for every serialised (individual or batch) product. The DID (and therefore the public key) is discoverable from the product serial number using the standard link resolver

protocol. The item/batch level DID is cryptographically linked to the product class level DID. The private key is discoverable from a QR code hidden inside the product packaging. Scanning the QR provides the necessary key to update the individual serialised product public status to indicate consumption. Attackers that copy genuine serial numbers will find that their products are quickly identifiable as fakes. Attackers that try to create new serial numbers will not be able to create valid links to the genuine product class. The UNTP anti-counterfeiting protocol provides additional value/incentive for UNTP uptake beyond ESG integrity.

Mass Balance

Mass balance fraud is a particularly challenging greenwashing vector. It happens when a fraudulent actor buys a small quantity of high ESG integrity inputs (eg genuine carbon neutral, organic, deforestation free cotton) and mixes that input with lower quality alternatives and then sells the full volume of manufactures product (eg woven cotton fabric) as sustainable product, re-using the valid credentials from the niche supply. The UNTP solution to this problem involves trusted third parties (certifiers or industry associations) to act as quota managers that issue "guarantee of origin" credentials (a type of conformity credential). In this model, the guarantee of origin certificate for 10 Tons of cotton fabric (for example) can only be issued when the third party has evidence of the purchase of at least 10 Tons sustainable input materials. The third party will also mark the input batch as consumed (in a similar way to the anti-counterfeiting protocol) so that the valid sustainable input cannot be re-presented to a different third party.

ESG Rules

Yet another greenwashing attack vector is to deliberately apply incorrect rules to the determination of criteria such as emissions intensity. The verification question in this case is "yes, but how do I know you calculated it right?". The UNTP proposes an independent calculator service offered either by the standards body or regulator that defined the rules or by an accredited service provider. The Supply chain actor presents raw data to the calculator which returns with a signed credential confirming that the rules were correctly applied. This protocol has an additional benefit for legitimate actors if widely adopted by rules authorities - which is to significantly simplify the assessment of compliance against multiple different rules. By separating observed facts from the assessment of those facts against specific rules then it becomes relatively simple to test compliance against multiple standards and regulations.

Transparency Graphs

! INFO

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Overview

The sustainability footprint of a finished product is the aggregation of its components and processes through the value chain. Verification of sustainability claims therefore involves assessing a bundle of linked credentials (aka a "transparency graph") drawn from all or part of a value chain. Whilst each credential may be valid in its own right, one challenge is verifying the context of related credentials. For example, a conformity assessment body that is accredited to test strength of structured steel might not be accredited to issue emissions intensity certificates. A technically valid emissions certificate linked to a technically valid accreditation certificate that has a different scope would be fraudulent. To address this problem, the UNTP defines a simple method to verify the contextual scope of linked credentials. This provides a mechanism to verify a linked graph of data at a layer above credential verification.

Trust Chains

In the world of verifiable credentials, it is crucial that such credentials are issued by trusted and accredited entities. Consider the scenario where GHG emissions of a product result in a GHG emissions tax that must be paid. In such cases, the potential for fraud is significant, as some manufacturers might falsely claim zero GHG emissions in their digital product passport or in a separate GHG emissions credential. To combat this, verifiers must be able to construct a chain of trust. For example

- A manufacturer issues a declaration in a UNTP Digital Product passport (DPP) that states an emissions footprint for a given product ID. If the verifier trusts the manufacturer then this may be sufficient. But often a third party attestation is needed.
- A third party Conformity Assessment Body (CAB) issues an attestation as a UNTP Digital Conformity Credential (DCC) about the same product ID that confirms the emissions footprint. If the verifier knows and trusts the CAB then this may be sufficient. But there are thousands of CABs and so it is very possible that the verifier does not know the specific CAB.
- A national accreditation authority issues an endorsement as a UNTP Digital Identity Anchor (DIA) which states that the CAB is accredited to issue certifications under a recognised scheme such as the [GHG Protocol](#). The number of accreditation authorities is only a little larger than the number of countries, so verifiers only need a short list of accreditation authorities ("trust anchors") in order to trust the chain from product manufacturer -> CAB -> national authority.
- Most national accreditation authorities are members of a global association such as [ILAC](#). If ILAC were to issue a credential attesting that national authority is a member then there is a chain of trust from manufacturer -> CAB -> national authority -> ILAC.

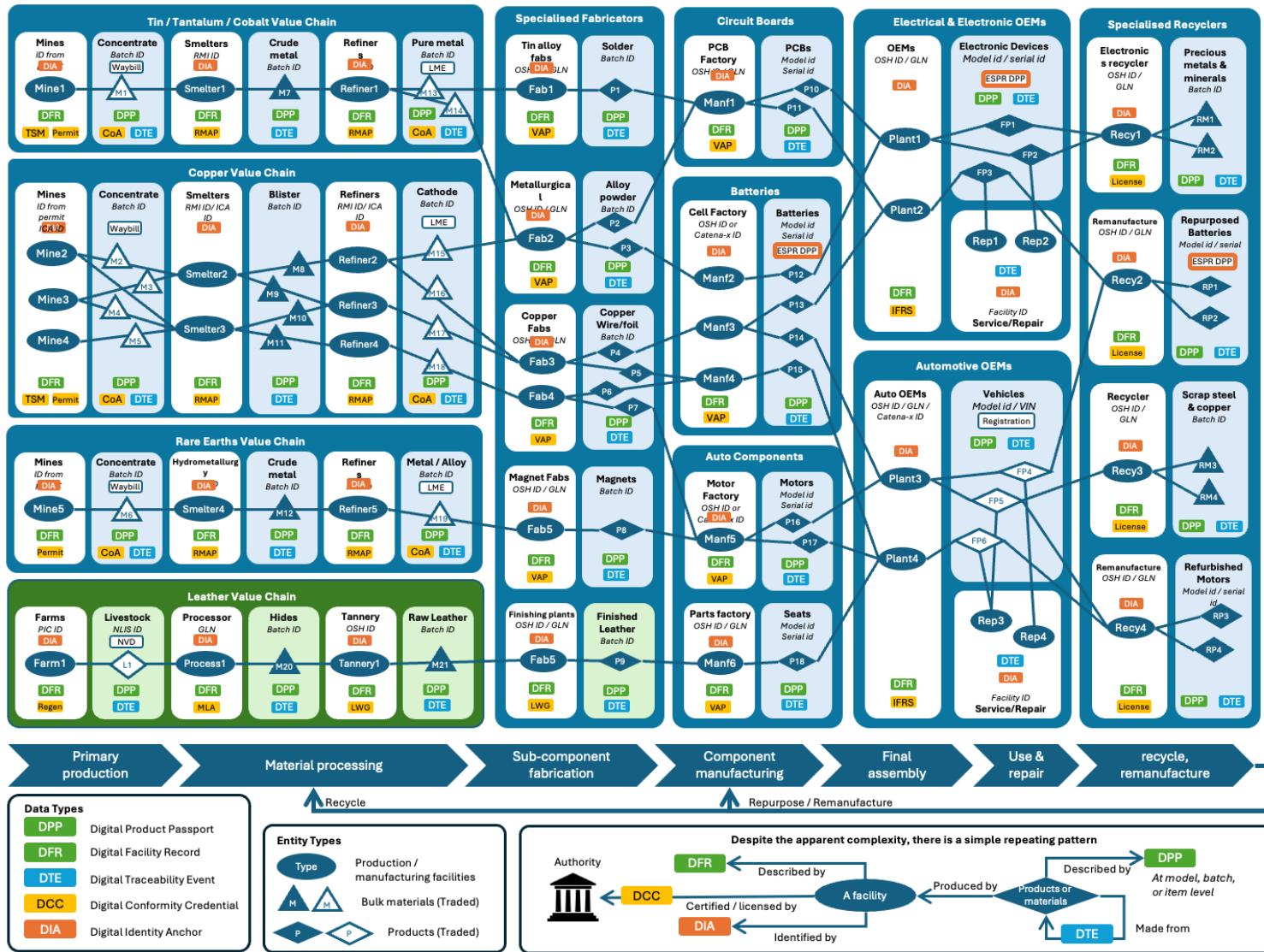
There are other trust chains that can be followed to anchor trust to a national or global authority that follows rigorous processes to manage accreditations and memberships. For example a battery passport may link to a certifier who is, in turn, accredited by the [global battery alliance](#). Verifiers of credentials should follow these linked credential chains until a trusted entity is reached. That could be at the first step or after several steps.

Transparency Graphs

A transparency graph is a linked set of identified nodes such as Product, Location, Facility, Party, Standard, Regulation, Criteria, Declaration, Attestation, or Endorsement. The data to construct a transparency graph comes from multiple individual credentials. When multiple credentials identify the same entity (eg a business, a facility, a product) then the graph will contain meaningful connections that can be used to make valuable verifications such as "product XYZ has a GHG assessment from CAB ABC". UNTP is designed to simplify the task of creating linked data graphs because UNTP credentials are represented as a collection of uniquely identified entities that are ready to be added to a graph.

- A Digital Product Passport or a Digital Facility Record provides a set of declarations (claims) against sustainability criteria defined in regulations or standards - made by a manufacturer party about a given product that is manufactured at a facility in a defined location.
- A Digital Conformity Credential is an attestation made by an endorsed conformity assessment body - which includes one or more assessments of a list of identified products or facilities against specific criteria.
- A Digital Traceability Event is used to link input materials and components to output products. Also to link supplier facilities to buyer facilities. This kind of information is usually more commercially sensitive than product passports or conformity attestations but, when made available to authorised actors, can be used to construct the graph of dependent products and facilities.

Although these credential types have different structures, they are assembled from the same core vocabulary building blocks. This allows a supply chain transparency system to construct a graph from a stream of DPPs, DFRs, DTEs, and DCCs. An example is shown below - for the case of critical minerals as material feedstock to electronic and automotive sectors.



Verifying Graphs

The digital verification of transparency graphs requires that verifiers understand and verify the contextual relationships between different credentials. For example that the subject of an identity credential is indeed the issuer of a product passport - or that the conformity criteria claimed in a product passport are indeed the same as the criteria in a third party assessment. This section provides guidance on how to express and verify these kinds of relationships.

Identity Verification

TBD

Conformity Criteria Verification

TBD

Anti-Counterfeiting

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Overview

As the value of genuinely sustainable goods increases, so do the incentives to sell fake goods as the real thing. UNTP defines a simple and decentralised anti-counterfeiting protocol that can be implemented by any producer at very low cost. It builds upon the W3C DID standard by issuing a unique DID (and corresponding keypair) for every serialised (individual or batch) product. The DID (and therefore the public key) is discoverable from the product serial number using the standard link resolver protocol. The item/batch level DID is cryptographically linked to the product class level DID. The private key is discoverable from a QR code hidden inside the product packaging. Scanning the QR provides the necessary key to update the individual serialised product public status to indicate consumption. Attackers that copy genuine serial numbers will find that their products are quickly identifiable as fakes. Attackers that try to create new serial numbers will not be able to create valid links to the genuine product class. The UNTP anti-counterfeiting protocol provides additional value/incentive for UNTP uptake beyond ESG integrity.

Product Serial DID

Product Serial VC

Brand Trust Root

Public Verification

Private Acquittal

Chain of Custody

! INFO

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Overview

Mass balance fraud is a particularly challenging greenwashing vector. It happens when a fraudulent actor buys a small quantity of high ESG integrity inputs (e.g., genuine carbon neutral, organic, deforestation-free cotton) and mixes that input with lower quality alternatives and then sells the full volume of manufactured product (e.g., woven cotton fabric) as sustainable product, re-using the valid credentials from the niche supply.

The UNTP solution to this problem involves trusted third parties (certifiers or industry associations) to act as *quota managers* that issue "guarantee of origin" credentials (a type of conformity credential). In this model, the guarantee of origin certificate for, say, 10 Tons of cotton fabric can only be issued when the third party has evidence of the purchase of at least 10 Tons of sustainable input materials. The third party will also mark the input batch as consumed (similar to the anti-counterfeiting protocol) so that the valid sustainable input cannot be re-presented to a different third party.

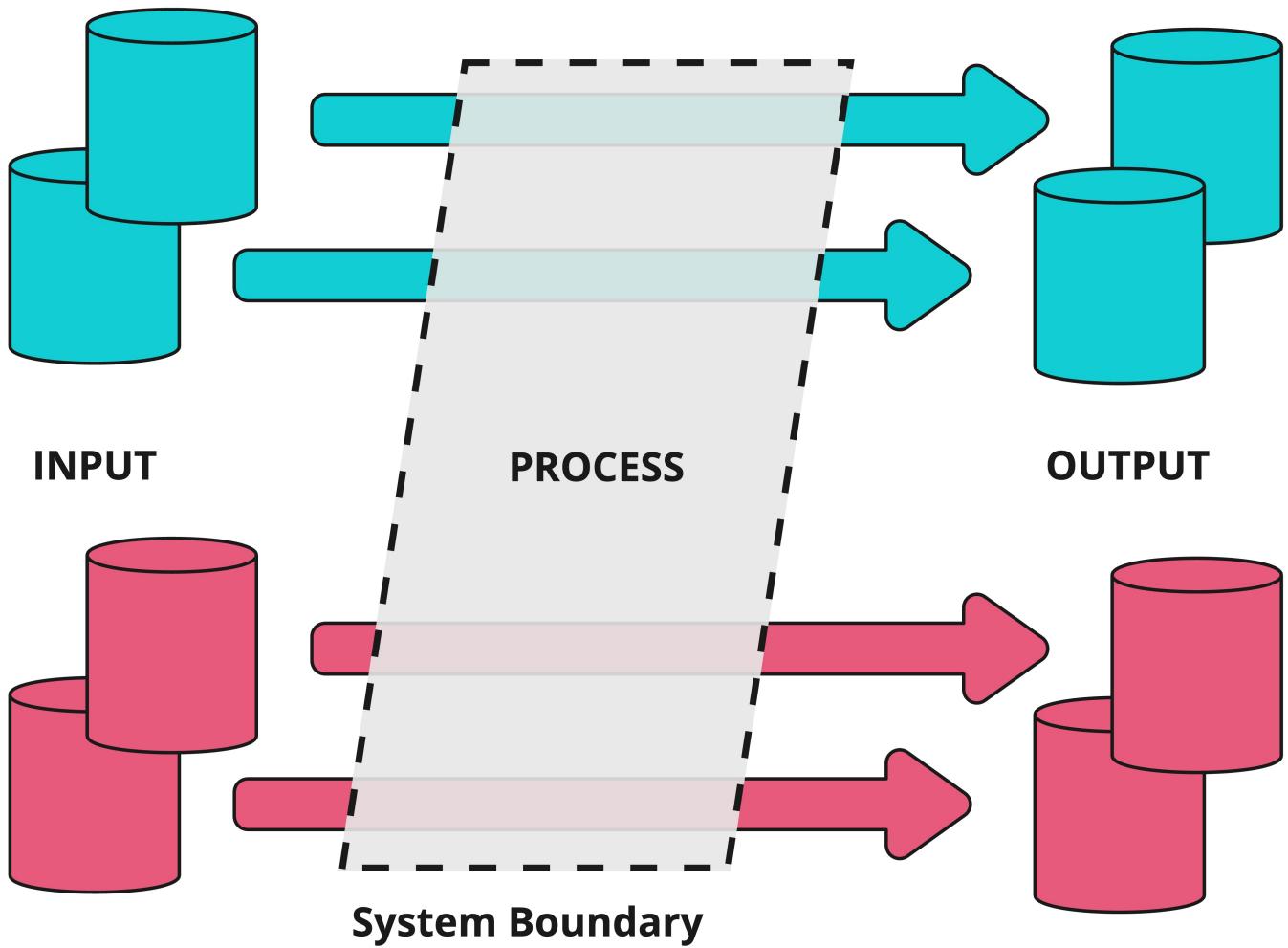
Chain of Custody Categorizations

Below are four categorizations of supply chain custody with aims of defining how sustainability claims and certified products are managed across supply chains.

Each categorization balances operational practicalities and assurance in different ways.

1. Identity Preserved (IP)

Under **Identity Preserved**, the exact certified source of the product remains unchanged and unblended throughout the supply chain. Every step, from producer to end-user, tracks and segregates the qualifying quantity so it is never mixed with non-qualifying quantities (or even other qualifying goods from a different source).



Benefits

This approach achieves maximum traceability, the strongest assurance, and a direct link back to a specific manufacturer, farm or origin. Its presence within a supply chain facilitates additional sustainability conformance requirements with minimal additional effort.

Challenges

Identity Preserved is among the most costly and complex approaches to implement, as it requires physical or instance-level identification and segregation at every stage of the supply chain.

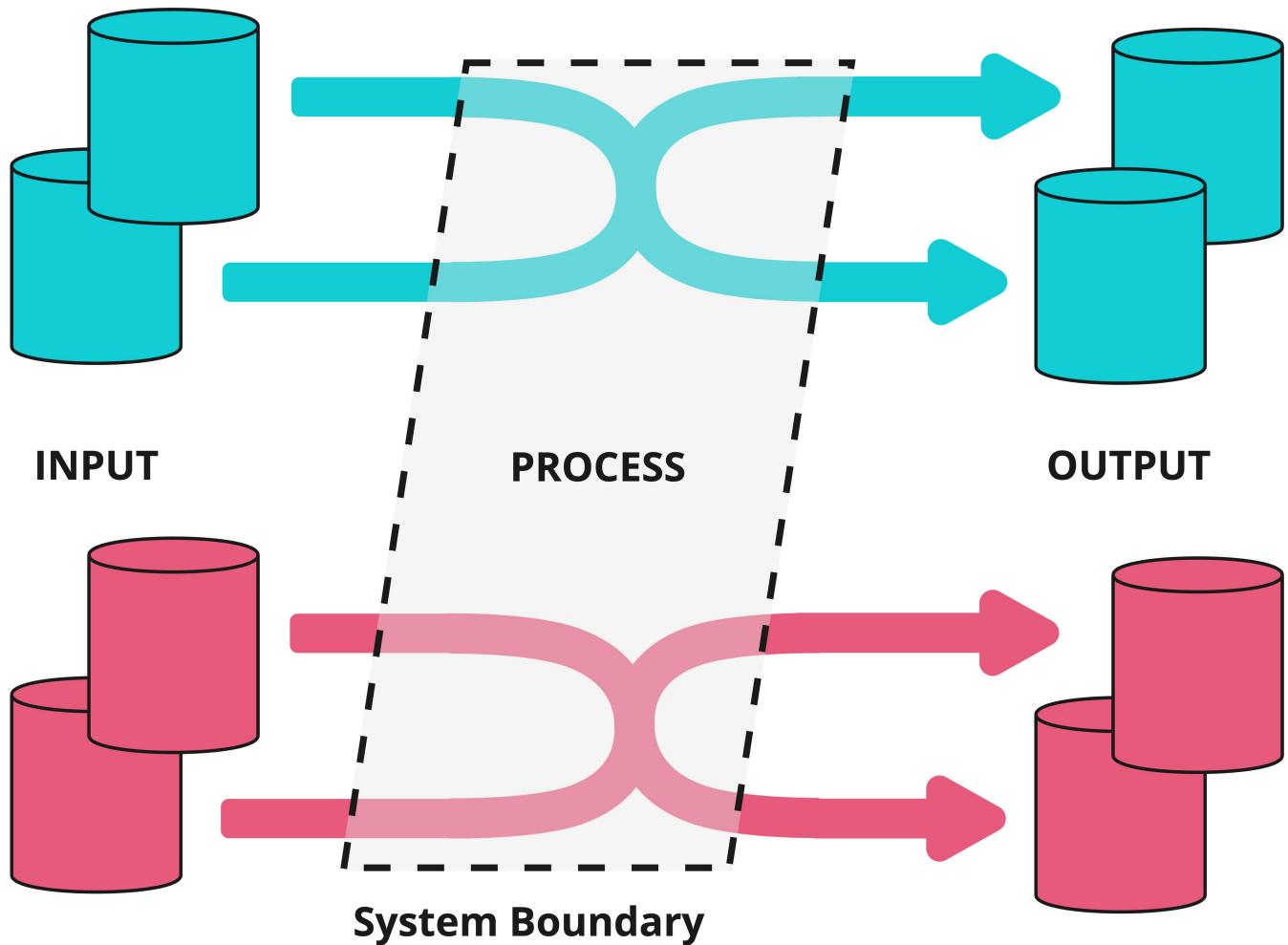
Example

A bag of coffee beans labeled "single-origin" from a specific farm, and remains separate from other coffee beans (qualifying or non-qualifying) throughout processing and transport.

Two production batches of coffee beans, from different origins, cannot be mixed. Even if both batches have identical ESG claims about them.

2. Segregated (SG)

In the **Segregated** model, qualifying quantities and non-qualifying quantities are never mixed. However, qualifying quantities from different certified sources (all meeting the same standard) may be combined. The final product is still 100% qualifying, but it is not guaranteed to come from a single farm, manufacturer, or origin.



Benefits

This scheme guarantees that the final product contains only qualifying material while allowing flexibility to pool multiple certified batches.

Challenges

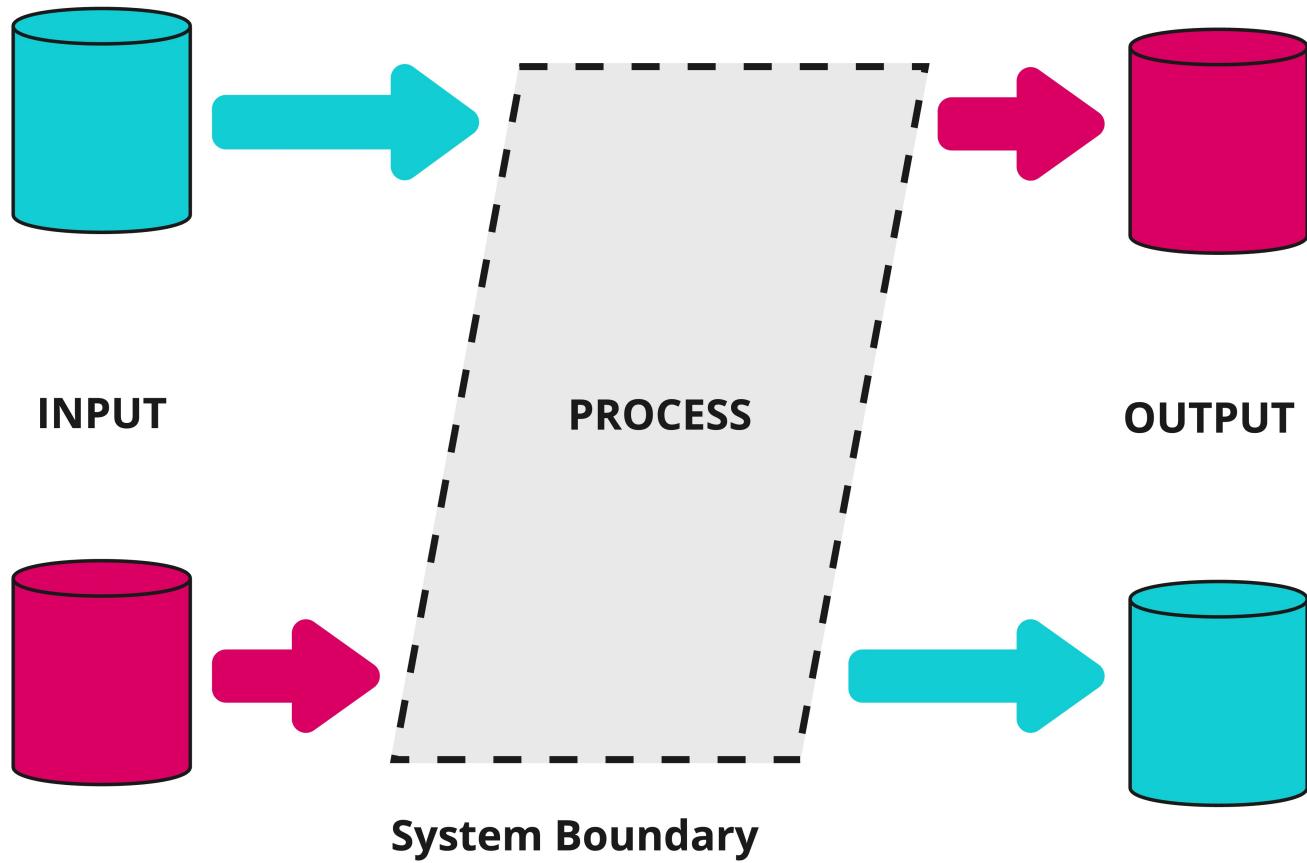
Still requires physical separation from non-qualifying quantities, which can increase logistics and storage costs.

Example

A chocolate manufacturer mixes cocoa beans from several accredited farms or origins, without adding any non-qualifying beans. The resulting cocoa batch is 100% qualifying but is not linked to a single farm, but many.

3. Mass Balance (MB)

In a **Mass Balance** system, controlled commingling of qualifying quantities and non-qualifying quantities is allowed, as long as the overall volume of qualifying outputs does not exceed the volume of qualifying inputs. Facilities and manufacturers track quantities over time to ensure that the percentage (or total amount) of "sustainable" outputs matches the actual qualifying inputs in the system.



Benefits

Mass Balance allows for the mixing of qualifying and non-qualifying goods at any stage in the supply chain. When such mixing occurs, only the equivalent quantities of qualifying goods can be sold or claimed to be "Mass Balanced" products.

This approach is well-suited for complex supply chains and provides flexibility for manufacturers to source goods sustainably, even when certain constraints exist, such as:

- Facilities unable to keep products separate during transportation or storage.
- Minimum quantities required for manufacturing or production not being fully met by qualifying quantities.
- The cost of keeping qualifying and non-qualifying materials separate leading to non-competitive pricing and hindering market development of certified materials.

Challenges

Dilution occurs at the physical level, meaning end-users and buyers cannot be certain that their specific product is made from qualifying materials—only that an equivalent volume of qualifying material was used elsewhere in the process.

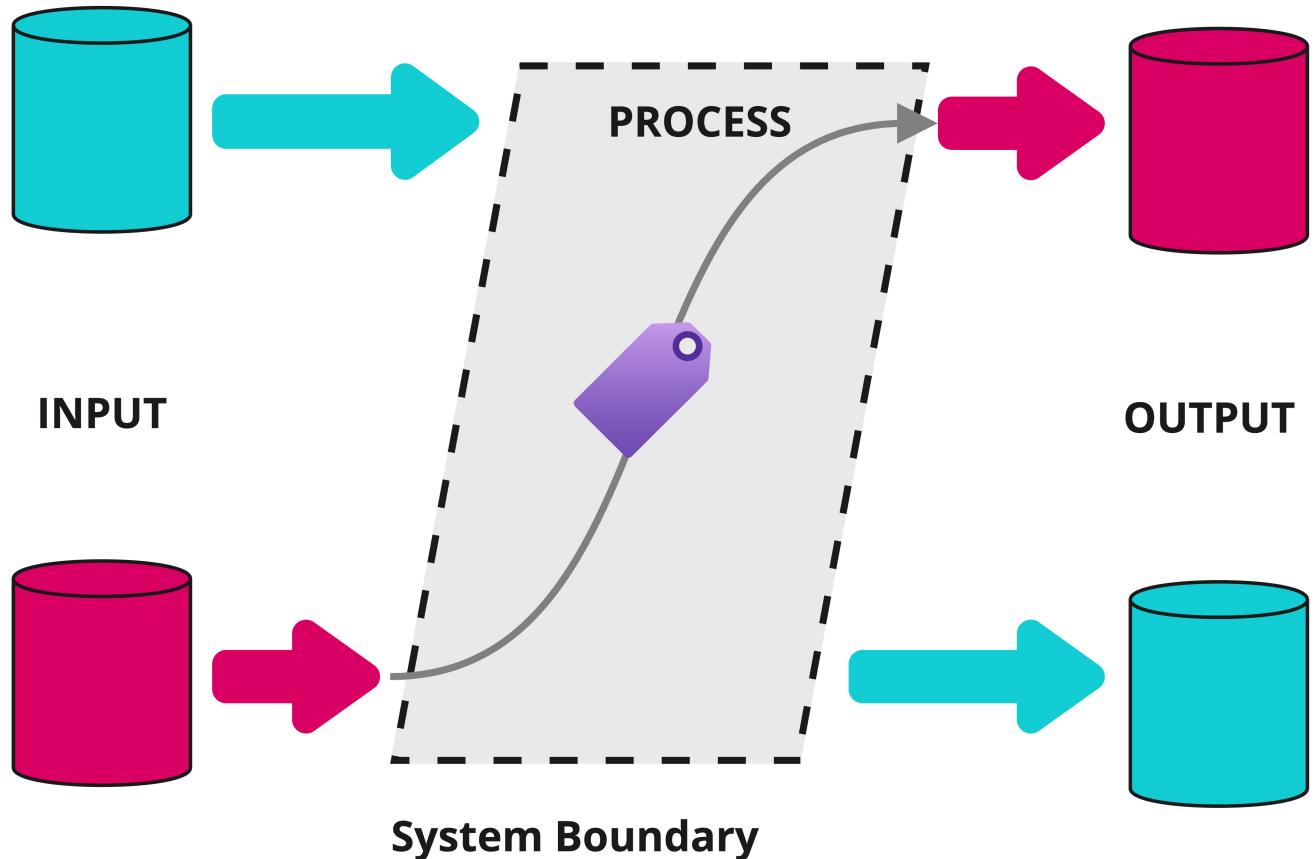
Example

A flour mill receives both certified organic wheat (40%) and conventional wheat (60%). During processing, these grains are mixed together. Under Mass Balance, the mill can sell up to 40% of its total flour output as "organic" since this matches the proportion of organic input wheat. The remaining 60% must be sold as conventional flour.

If the mill processes 100 tons of wheat in total (40 tons organic, 60 tons conventional), they can sell up to 40 tons of the resulting flour as organic, regardless of which specific flour particles came from which wheat source. This allows efficient processing while maintaining accurate sustainability claims based on input ratios.

4. Book-and-Claim (BC)

In **Book-and-Claim** models, sustainability attributes (e.g., "deforestation-free," "carbon-neutral") are fully **decoupled entirely from the physical flow of goods**. A producer meeting the standard "books" or issues credits into a registry, and a buyer can purchase (or "claim") those credits even if the physical product they receive is not the certified batch or instance.



Benefits

Book-and-Claim simplifies sustainable sourcing in complex supply chains where full traceability across all actors is prohibitively expensive. It provides a pathway for small and medium enterprises (SMEs), smallholder farmers, and similar entities to participate in sustainability initiatives without requiring their local procurers (e.g., mills, aggregators, or intermediaries) to adopt traceability or compliance practices.

For producers:

- SMEs or smallholder farmers can "book" credits for certified production and sell their goods into local, uncertified supply chains as usual. These credits can be transacted globally, overcoming geographic limitations and enabling access to new markets and potential premium pricing.

For buyers:

- When uncertified inputs are used in the production of final goods, purchasing or "claiming" credits allows buyers to offset the environmental or social impact of those uncertified inputs.

The number of credits a producer can sell is strictly governed by the certification standard backing the credits they "book." This enables sustainable production to extend its reach even in supply chains lacking comprehensive traceability infrastructure.

Challenges

A trusted registry is essential to ensure that no double-counting or over-issuance of credits occurs, as the decoupled nature of this model requires robust governance and verification mechanisms.

Example

A palm oil producer in Indonesia receives certification that their production methods are deforestation-free. They sell their physical palm oil to local processors (who may not track sustainability credentials), but can separately sell "deforestation-free credits" to global manufacturers.

A soap manufacturer in Europe, unable to source certified deforestation-free palm oil directly, can purchase these credits to offset their use of conventional palm oil. For every ton of conventional palm oil they use, they purchase and retire one ton of deforestation-free credits. This allows them to claim their soap products support deforestation-free palm oil production, even though the physical palm oil in their products may not be from certified sources.

The credits ensure that for every ton of conventional palm oil used in Europe, an equivalent ton of certified deforestation-free palm oil was produced somewhere in the world.

Transparency and Evidence

As always, a balance between the demands for transparency (more supply chain visibility means it is easier to prove either IP, SG, MB, or BC) and confidentiality (share too much data, and risk exposing commercial secrets) is required. As always a key UNTP principle is allowing all supply chain actors to be able to choose their own balance between transparency and confidentiality.

The following address the three of the four models proposed against varying levels of transparency. "Book-and-Claim" due to its unique nature of being decoupled from physical products is outlined separately [here](#).

Third Party Attestations

Commercial sensitivities or purchasing requirements from the buyer are likely to introduce the need of a third party making a attestation. This protects the sellers commercial interests of procured volumes and sources, it also appeases the buyers concerns of the seller double counting, or performing fraudulent activities.

The trusted third party collects evidence to support either IP, SG, or MB chain of custody, are issues a credential to the seller attesting their compliance.

Identity Preserved (IP)

The credential issued by the third party attests that:

- Identity Preserved practices have occurred.
- The credential schema of the "original" sustainability credential for the qualifying goods.

```
{  
  "category": "identityPreserved",  
  "credentials": [  
    {  
      "schema": "...",  
      "hashOfSource": "..."  
    }  
  ]  
}
```

- `schema` is a reference to the original sustainabilities credential schema, allowing the verifier/buyer to know what claims are being attested.
- `hashOfSource` is a hash of the original sustainability credential, in case of a audit.

Segregated (SG)

The credential issued by the third party attests that:

- Segregation practices have occurred.
- The credential schema of the "original" sustainability credential for the qualifying goods.

```
{  
  "category": "segregated",  
  "credentials": [  
    {  
      "schema": "...",  
      "hashOfSource": "..."  
    }  
  ]  
}
```

- `schema` is a reference to the original sustainabilities credential schema, allowing the verifier/buyer to know what claims are being attested.

- `hashOfSource` is a hash of the original sustainability credential, in case of a audit.

Mass Balance (MB)

The credential issued by the third party attests that:

- Mass balance evidence has been collected
- The credential schema of the "original" sustainability credential for the qualifying quantities
- The percentage of output quantities that can be claimed against the schema

```
{
  "method": "massBalance",
  "credentials": [
    {
      "schema": "...",
      "hashOfSource": "...",
      "startDateTime": "...",
      "endDateTime": "..."
    }
  ]
}
```

In the schema above,

- `schema` is a reference to the original sustainabilities credential schema, allowing the verifier/buyer to know what claims are being attested.
- `hashOfSource` is a hash of the original sustainability credential, in case of a audit.
- `startDateTime` and `endDateTime` are the audit period mass balance was determined over.

Discoverable Evidence

Specification will be outlined on the feasibility, and practicalities on data discoverability within a transparency graph to support different chain of custody models, without relying on a third party making an assessment.

Book-and-Claim

Due to nature of **Book-and-Claim** in that the sustainability credential is entirely decoupled from the physical goods, different challenges arise.

1. Credentials holders need a method to "book" quantities of certified goods that they eligible for.
2. Credential holders need to be able to "transfer" these credits to buyers globally.
3. Credential holders cannot "book" the same quantity multiple times, or "transfer" the same credit to multiple buyers.
4. Buyers of these credits must be able to subsequently transfer to future buyers, without the original party who created the credential knowing.

5. Holders of credits must be able to "retire" when a quantity associated with the credit is used in the manufacturing process.
 - Example, a credit represents 1kg of carbon-neutral wheat, and a miller consumes 1kg of non-qualifying wheat. The credit is retired, and the miller can claim the sustainability credential for 1kg of the flour produced.
6. Manufactures consuming credits can provide evidence to their buyers of credit ownership, and retirement in their manufacturing process.
 - Example, the miller producing the flour can show evidence to buyers that equivalent credits were purchased for its production, and also retired.

Implementation

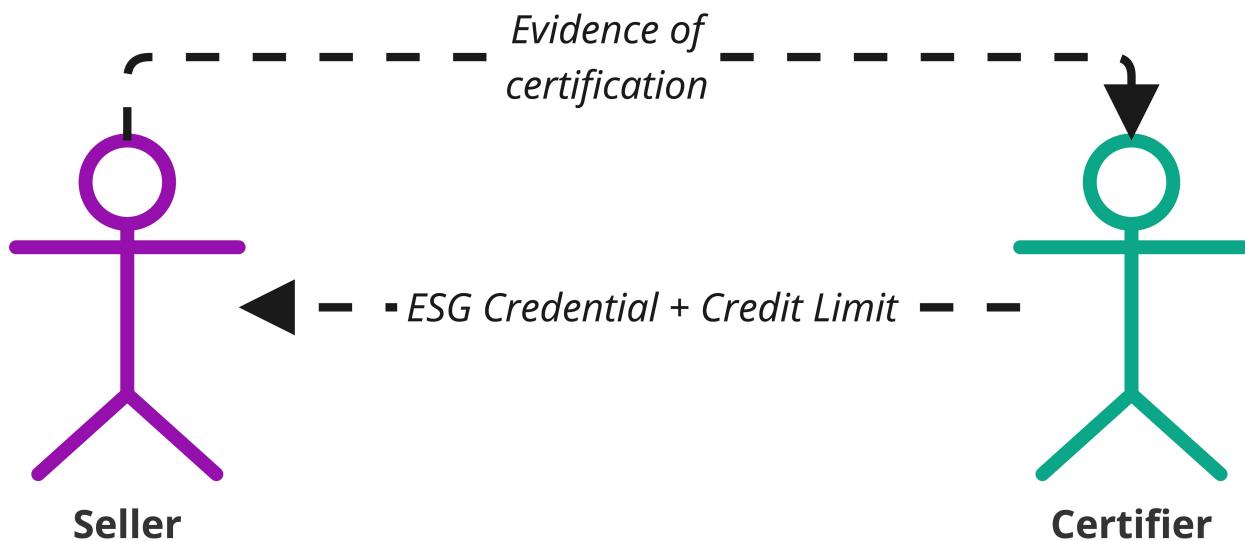
Below is a potential implementation and workflow using generic actor names - representative of any supply chain, commodity, product, or ESG credential.

Each section is appended with a rolling use case of a wheat producer receiving a carbon-neutral certification from a trust anchor, **tokenizing** that credential against a specific quantity of wheat produced, transferring ownership of that credit to a miller outside their supply chain or geographic region. And finally, the miller subsequently retiring the credit(s) after milling milled an equivalent of non-qualifying wheat and presenting evidence to buyers of their flour that appropriate credits were used.

1. Credential issuance

A certifier makes an assessment against a ESG criteria and issued sustainability credential to the seller. The credential also specifies the allowable production quantities that can be "booked" (converted into credits) under the claim.

The issuer could make the assessment of the upper limit of credits that can be booked based on volume prediction models, looking at historical averages, or comparable industry bench marks for the seller.



Example: The wheat producer provides sufficient evidence that their farming enterprise is carbon-neutral and receives a credential confirming attesting this. The certifier, using wheat production averages for the region, an understanding of the production area size of the farm, and satellite imagery assesses that a production volume of 1000t of wheat for the upcoming harvest period is feasible for this particular producer.

The wheat producer now has the ESG credential, and the ability to "book" up to 1000t of wheat produced from their farm.

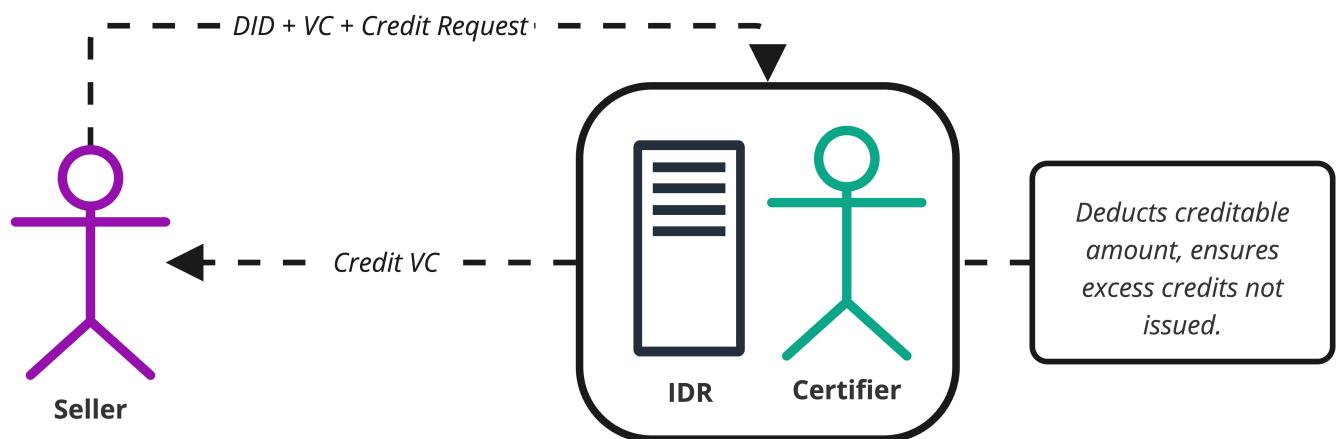
2. "Booking" Credits

The seller performs their production/manufacturing activities, and when a quantity of product is produced, they can then tokenize the ESG credential as a credit.

The seller tokenizes credits against the certifiers register (potentially an IDR operated by, or on behalf of, the certifier). By doing so, the seller receives a credential from the certifier for the qualifying quantity.

```
{  
  "credentialSubject": {  
    "id": "did:example:seller",  
    "quantity": {  
      "quantity": 1,  
      "uom": "KGM"  
    },  
    "schema": "https://.../schema.json",  
  },  
  "proof": { ... }  
}
```

This VC enables the seller to present evidence of their certified claim to potential buyers. Buyers can independently verify the credential's authenticity and confirm that the credit is genuinely held by the seller via the certifiers IDR.



Example: The wheat producer has harvest 75t of wheat, and receives 75 1t carbon-neutral credits from the certifier. The wheat producer now has 75 credits to sell to a potential buyer somewhere in the world.

Potential buyers are able to verify the VC attesting the credit to ensure it is valid, not revoked, in date, and is in fact owned by the wheat producer as well as the ESG schema the token reflects.

The wheat producer is free to sell any allotment of these 75 credits to any number of buyers.

3. Transferring (selling) credits

The seller wishes to sell the credit to a buyer in a different geographic region.

To initiate the transfer:

1. The seller submits a transfer request to the certifier register operator (e.g., the IDR system), providing:

- i. The buyer's DID.
- ii. A reference to the specific credit(s) being transferred.
- iii. A digital signature generated using the sellers private key.

2. The register operator verifies the transfer request by:

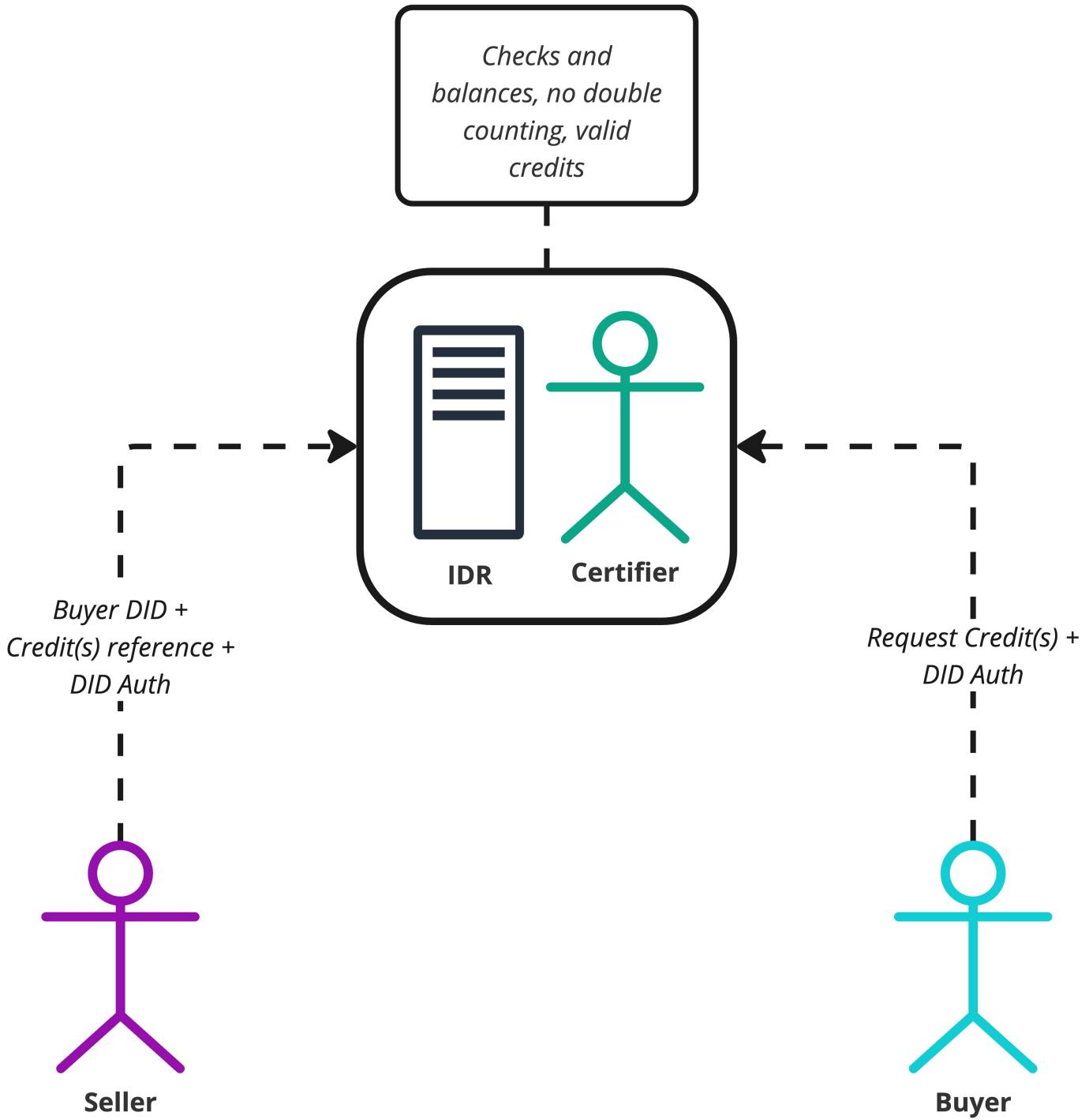
- i. Authenticating the seller and buyer DIDs.
- ii. Confirming the validity of the credit(s) referenced in the request.

3. Upon approval:

- i. Ownership of the credit is transferred to the buyer.
- ii. The original credential held by the seller is revoked.
- iii. The buyer receives a new credential representing the transferred credit.

The buyer can receive this credential for the credit purchased by making a request using did authentication.

The register operator is able to ensure no double counting is occurring, and any other verification requirements for their industry.



Example: The wheat producer and a miller have come in agreement to transfer 10 1t credits of carbon-neutral wheat. The wheat producer initiates the transfer with the certifier by providing information about the buyer, and the 10 credits to be transferred.

The register operator for the carbon-neutral credits can verify the credits are legitimate, no double counting is occurring, the credits are not in escrow in another concurrent transaction, and any other industry requirements pertaining to carbon-neutral wheat credits.

The buyer can then request the register operator for these 10 credits, and the register operator can issue a new set of 10 credits to the buyer, and revoke the previous 10 held by the seller.

The buyer is then free to then transfer these 10 credits, or provide as evidence, to other actors in the supply chain, without the *original* seller knowing.

4. Retiring credits

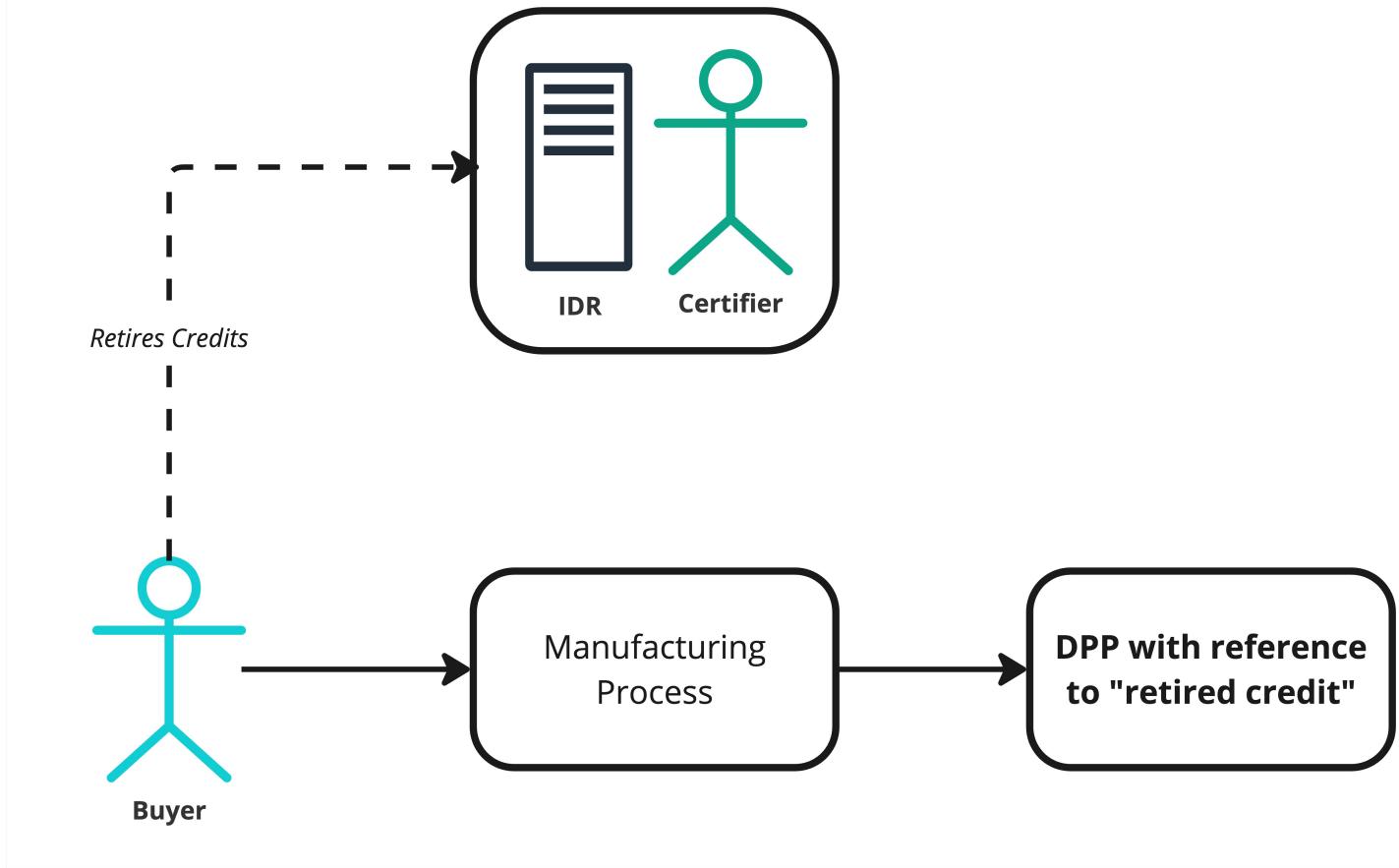
Once the buyer performs a manufacturing process and uses non-qualifying quantities of the product their process. They retire the equivalent quantities of credit to ensure its sustainability attributes are appropriately accounted for.

Steps to retire the credit:

1. The buyer submits a retirement request to the certifier register, authenticated using their DID. The request references the specific credit(s) being retired.
2. The certifier register processes the request, marking the credit as retired and preventing it from being reused or double-counted, or transferred in the future.
3. The buyer receives evidence of retirement, potentially in the form of another Verifiable Credential that references the original credit - forming a link of evidence of retirement, evidence of credit purchase, and reference to the underling ESG schema from the credential from the original seller.

This retirement evidence can then be linked to the Digital Product Passport (DPP) for the manufactured products, enabling downstream buyers to verify:

- The schema associated with the original credit.
- The identity of the certifier who issued the initial credential to the seller.
- The integrity of the credit lifecycle, including its transfer and retirement, validated by the certifier register operator to prevent double counting.



Example: The miller has purchased 10 1t carbon-neutral wheat credits from the farmer. The miller mills 10t of non-qualifying wheat as they have no practical and physical access to certified carbon-neutral wheat. The miller, however, wants to claim 10t of output flour as carbon-neutral.

The miller retires the 10 credits with the certifier register operator, and receives evidence of credit retirement. The miller, in a Digital Product Passport for the flour, can reference this evidence as proof to buyers.

The buyer of the flour can be confident that 10t of production of carbon-neutral wheat occurred somewhere globally, under a framework that they trust as per the credential schema, and that this 10t has not been double counted elsewhere in the supply chain.

Outcomes

- Producers are incentivized to receive ESG credentials, even if their local supply chain does not demand it.
- Producers are able to sell these credits to buyers globally, and receive a premium for their sustainable practices.
- The Book-and-Claim model is not dependent on a single technology choice, or platform.
- The certifier register operator can ensure credit quotas are not exceeded, double counting did not occur, and proper transfer of credits.
- Manufacturers are able to retire purchased credits, and provide evidence to their buyers that credits have been purchased against the ESG schema of interest.

Implementation Guidance

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Implementation Of UNTP

Implementation of UNTP will be a very different experience for organisations of different size, industry/geography sector, and stakeholder type. The purpose of this page is to help potential implementers navigate quickly and simply to the relevant scope of work.

Has Five Simple Steps

At a macro-level, there are just five steps for any UNTP implementer to follow.

Step	Action	Outcome
1	Review the business case section to confirm that UNTP implementation is likely to deliver value for your organisation. Establish key performance measures to track costs and benefits.	Positive business case
2	Review the UNTP and/or UNTP extensions pages relevant to your organisation type and to determine which credentials you should be issuing. Register your (non-binding) intent to implement so that you gain access to community support.	Implementation intent registered
3	Choose a software product or request your existing software system provider to implement UNTP. Test your implementation using the UNTP test service . Use support channels as needed.	Update implementation register with positive test results
4	Run a pilot with any other registered implementer(s) that has completed testing to confirm interoperability and value. Contact support to facilitate coordination of pilot activities	Successful pilot
5	Ramp up to full production volumes, routinely issuing and verifying UNTP credentials. Measure cost and benefit performance indicators to track ongoing	Consider publishing your story as an UNTP case

Step	Action	Outcome
	value	study

Details Vary With Your Context

Organisation Size

- **Small businesses** (under 20 employees) are likely to find themselves using UNTP simply because their commercial off the shelf (COTS) business software system has implemented UNTP to support transparent digitalised supply chains. Just as small businesses make international payments without knowing anything about ISO-20022, so they would issue and verify digital product passports without knowing about UNTP.
- **Medium businesses** (20 to 200 employees) will also be using commercial off the shelf software but are likely to have developed some customized solutions and internal integrations that mean UNTP implementation is not simply a case of just using compliant software. Some implementation and testing costs will be incurred.
- **Large enterprise** (over 200 employees) will usually have a complex ICT landscape with multiple systems and will usually need to engage their ICT department for a UNTP implementation.

Organisation Type

Stakeholder	Implementation Scope
Producers, Manufacturers, and Brands - produce raw materials, manufacture goods, own brands.	Implement UNTP Extensions Issue <i>Product Passports, Facility Records, and Traceability Events</i> according to guidelines specified in <i>industry extensions</i> so that your customers can easily verify your compliance and meet their due diligence obligations
Registry Operators - Maintain authoritative registers of products, assets, facilities, and businesses.	Implement UNTP Core Implement <i>Identity Resolver</i> and <i>Identity Anchor</i> so that your registered members can prove their identity and link discoverable credentials such as <i>Product Passports, Facility Records</i> to their product or facility identifiers.
Conformity Assessment Bodies - Provide test and certification services to certify compliance with recognised schemes and regulations	Implement UNTP Extensions Issue <i>Digital Conformity Credentials</i> according to extensions defined by the relevant <i>Scheme owners</i> or <i>Regulators</i>
Member Associations - Represent and advocate for industry interests	Create UNTP Extensions <i>Activate communities</i> to participate in transparent and traceable value chains by governing the design and maintenance of UNTP <i>industry extensions</i> .

Stakeholder	Implementation Scope
Regulators - Enforce compliance with laws and regulations.	Implement UNTP Core Issue regulatory permits, licenses, and certificates as <i>Digital Conformity Credentials</i> so that exporters can prove their compliance to customers and other authorities. Also automate border compliance and risk assessments by verifying <i>Product Passports</i> , <i>Conformity Credentials</i> and <i>Identity Anchors</i> that accompany imports
Software Vendors - Develop software solutions that underpin business operations and facilitate participation in transparent value chains.	Implement UNTP Core Add support for <i>Verifiable Credentials</i> and <i>Decentralised Access Control</i> to software products and, depending on your target market, the ability to issue all UNTP credential types (DPP, DFR, DCC, DTE, DIA) including relevant industry specific <i>extensions</i> .
Scheme Owners - Develop sustainability standards and associated assessment criteria	Create Sustainability Vocabularies Describe your existing schemes and criteria as a digital <i>Sustainability Vocabulary Catalog</i> so that your conformity criteria can be referenced by issuers of claims in <i>Product Passports</i> and assessments in <i>Conformity Credentials</i> .
Consumers - Choose, purchase and use products.	Verify Sustainability Claims Scan data carriers, view digital product passports, make purchase decisions

Industry and Geographic Sector

UNTP has been designed as an industry and geography agnostic standard - with a framework for multiple industry and/or geography specific extensions. This raises the question for implementers - whether to implement support for UNTP core or for specific industry extensions. The answer depends on your role.

- UNTP Core specifications are targeted at [Software Vendors](#), [Registry Operators](#), [Regulators](#) and [Scheme Owners](#).
- UNTP [industry extensions](#) are created by [Industry Associations](#) and implemented by Producers, Manufacturers, and [Brands](#) that are members of the association using UNTP compliant software.

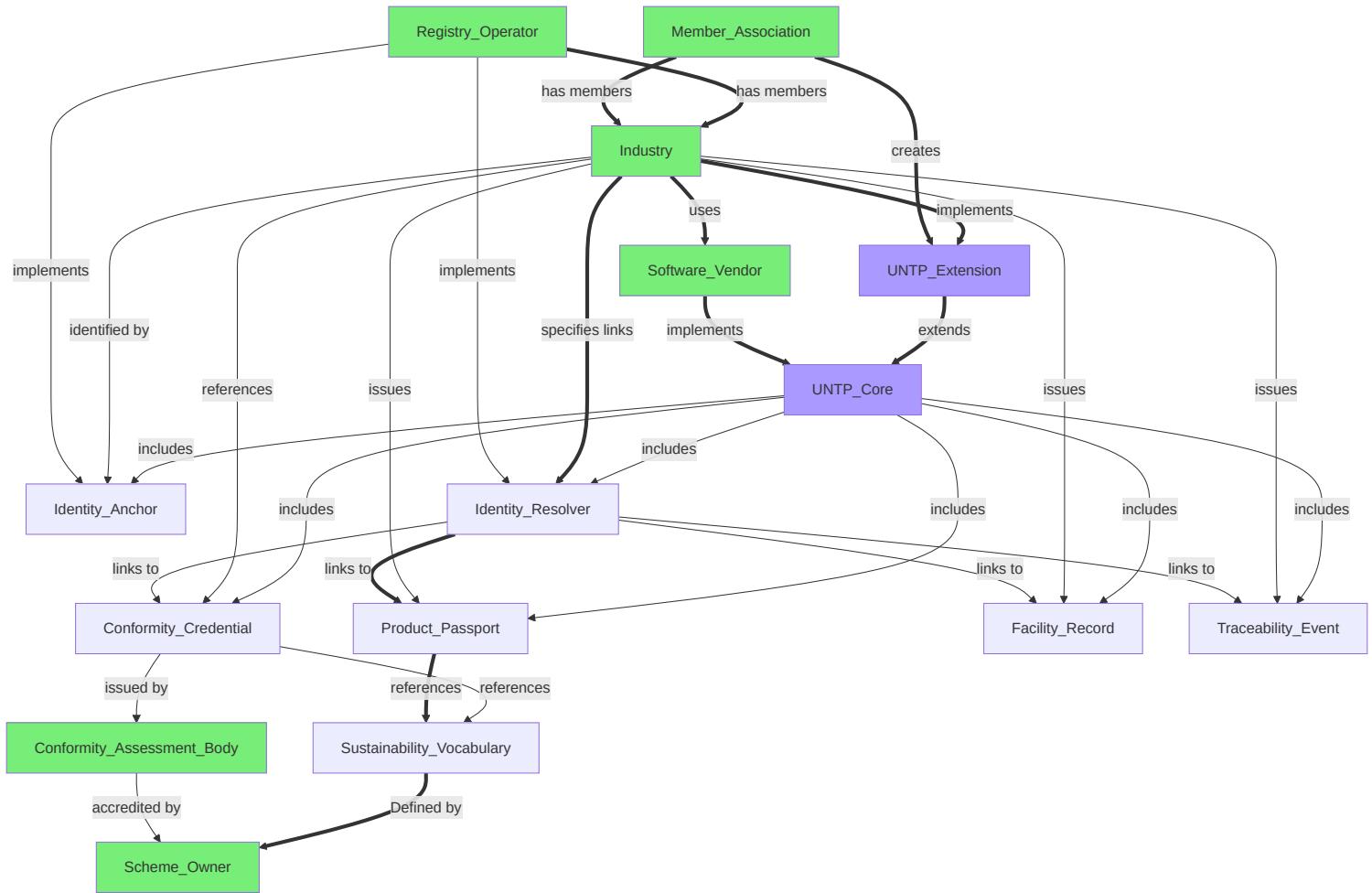
And Some Key Dependencies

Whilst any individual industry actor can choose to implement UNTP in isolation, there are some important economies of scale that make implementation at scale far more feasible. The dependency map below shows UNTP specification elements in purple and stakeholder type in green with dependencies between them described by the arrows. The most important dependencies are highlighted in bold:

- A **UNTP Extension** adds industry specific needs to the generic **UNTP Core** specification and is best coordinated by a **Member Association** that creates the extension once for use by all members.
- A **Software Vendor** such as a production management system implements UNTP within their software package once and it becomes available for use by all their **Industry** customers.

- A **Registry Operator** implements the UNTP **Identity Resolver** and **Identity Anchor** specification so that every identifier (of a product or facility) issued to any of their **Industry** members can be used as a pointer to the **Product Passport**
- A **Scheme Owner** specifies their rules as a **Sustainability Vocabulary** so that claims in **Product Passports** and assessments in **Conformity Credentials** can unambiguously reference the sustainability criteria.

The focal point for coordinating the participation of Industry, Software Vendors, Registry Operators and Scheme Owners is the Member Association that creates a UNTP Extension



Implementation Plans

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UNTP is a collection of specifications that work together to enhance traceability and transparency in global supply chains. But each stakeholder type plays a different role and so will implement different subsets of UNTP. This page provides more specific implementation guidance for each stakeholder type. The [general steps](#) of confirming business value, choosing solutions, registering intent, testing, and registering implementation apply to all and are not repeated here.

For Producers Manufacturers and Brands

Meet your supply chain due diligence obligations and provide evidence to your customers that allows them to meet their own obligations.

Step	Action	Outcome
1	Choose a relevant UNTP industry extension or lobby your member association to develop a new extension	Industry-wide consensus
2	Choose a UNTP compatible software solution or engage your ICT department to implement UNTP using our free reference implementation	Technology-ready
3	Push your suppliers to issue UNTP DPP , DFR with linked DCC credentials	Meet your supply chain due-diligence obligations
4	Issue a digital facility record for each facility you own/operate	Your customers can verify sustainability performance of your production facilities
5	Issue a digital product passport for each product (and optionally each export market) that you ship from your facilities	Your customers can verify sustainability performance of your products
6	Choose conformity assessment bodies that can issue digital conformity credentials that attest your conformance with relevant schemes and regulations.	Prove your product and facility conformity

Step	Action	Outcome
7a	Issue digital traceability events to link your manufactured products to the input components or materials used	Your customers can verify your product origin/traceability
7b	Where traceability information is commercially sensitive, request a trusted third party (eg a conformity assessment body or your member association) to assess traceability data and issue an independent guarantee of origin conformity credential	Your customers can trust an independent assessment of origin
8	Request identity anchor credentials from your national business/trademark/land register and link them to your issuer decentralised identifier	Reduce counterfeiting risk and prove your identity

For Member Associations

Activate [communities](#) to participate in transparent and traceable value chains by governing the design and maintenance of UNTP [industry extensions](#).

Step	Action	Outcome
1	Review the UNTP Community Activation Program to understand the business case for creating a community extension, the stakeholder roles, and scope of work	Case for extension is made
2	Establish an extension governance group that includes relevant representation from member organisations and other relevant stakeholders. Define the high level scope of your extension and register it as a proposed UNTP extension	New extension plan is registered
3	Following the extensions methodology and using existing registered extensions as examples, develop the extension specification draft as a public website and related testing and implementation support tools.	Extension draft available as public website
4	Complete pilot testing with early implementers of your extension specification. Update the extension specification with lessons learned from pilots and release a final version for widespread adoption.	Tested final version released
5	Scale up implementations across your community and track impact and value, reporting summary KPIs to UNTP according to the value assessment framework	Quantifiable value achieved

For Registry Operators

Empower your members with verifiable identity and identifiers as signposts to verifiable data.

Step	Action	Outcome
1	Implement the Identity Anchor specification	Registry members can prove that they are the genuine controller of the registered identity.
2	Implement the Identity Resolver specification	registered members can prove their identity and link discoverable credentials such as Product Passports , Facility Records to their product or facility identifiers.
3	Register the implementation	Verifiers can confirm not only the member identity but also that the register itself is legitimate

For Scheme Owners

Make compliance with your scheme digitally verifiable.

Step	Action	Outcome
1	Describe your existing schemes and criteria as a digital Sustainability Vocabulary Catalog	conformity criteria can be referenced by issuers of claims in Product Passports and assessments in Conformity Credentials
2	Provide sample Conformity Credentials that reference scheme criteria and represent what CABs are expected to issue.	Samples are available that simplify implementation for Conformity Assessment Bodies (CAB)

For Regulators

Make compliance with your regulations digitally verifiable.

Step	Action	Outcome
1	Publish your existing regulations and criteria as Sustainability Vocabulary Catalog	Conformity criteria can be referenced by issuers of regulatory compliance claims in Product Passports and assessments in Conformity Credentials
2	Issue regulatory permits, licenses, and certificates as Digital Conformity Credentials	Exporters can prove their compliance to customers and other authorities.

Step	Action	Outcome
3	Establish digital verification framework for imports including Product Passports , Conformity Credentials and Identity Anchors	Automate border compliance and risk assessments with higher identity integrity and reduced piggybacking

For Conformity Assessment Bodies

Make your third party conformity assessments digitally verifiable.

Step	Action	Outcome
1	Issue Digital Conformity Credentials that attest conformity with schemes or regulations following examples published by scheme owners	Your customers can digitally prove conformity of their products or facilities.

For Software Vendors

Empower your customers to participate in sustainable value chains. For software vendors, the specific UNTP (or extension) implementation requirements will depend on your customer role and needs.

Software type	Action	Outcome
Verifiable credential / identity platforms	Support Verifiable Credentials Profile and Digital Identity Anchor	Your software libraries are easily integrated with business software systems to support UNTP implementations
Traceability platforms	Follow links to find and verify product passports , facility records , traceability events , and conformity credentials to construct transparency graphs representing n-tier traceable supply chain	your customers have the data to meet their due diligence and compliance reporting requirements.
Production Management Systems (PMS) or ERP systems	Issue facility records , product passports , and traceability events that describe the manufacturing facilities, manufactured products, and upstream materials.	Your customer can link high integrity sustainability information to their products and facilities.

For Consumers

Scan data carriers, view digital product passports, make purchase decisions.

Test Services

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Test Playground

UNTP provides a test playground where implementers can

- Test their own credentials for conformity to UNTP standards.
- Access UNTP standard sample credentials.

There are two playground instances - one for the current release and also one for the

Current release playground

For testing against the current UNTP release version credential specifications.

URL: <https://test.uncefact.org/test-untp-playground>

Latest bleeding-edge playground

For testing against the latest bleeding edge experimental versions.

URL: <https://test.uncefact.org/untp-playground>

Full Test Service

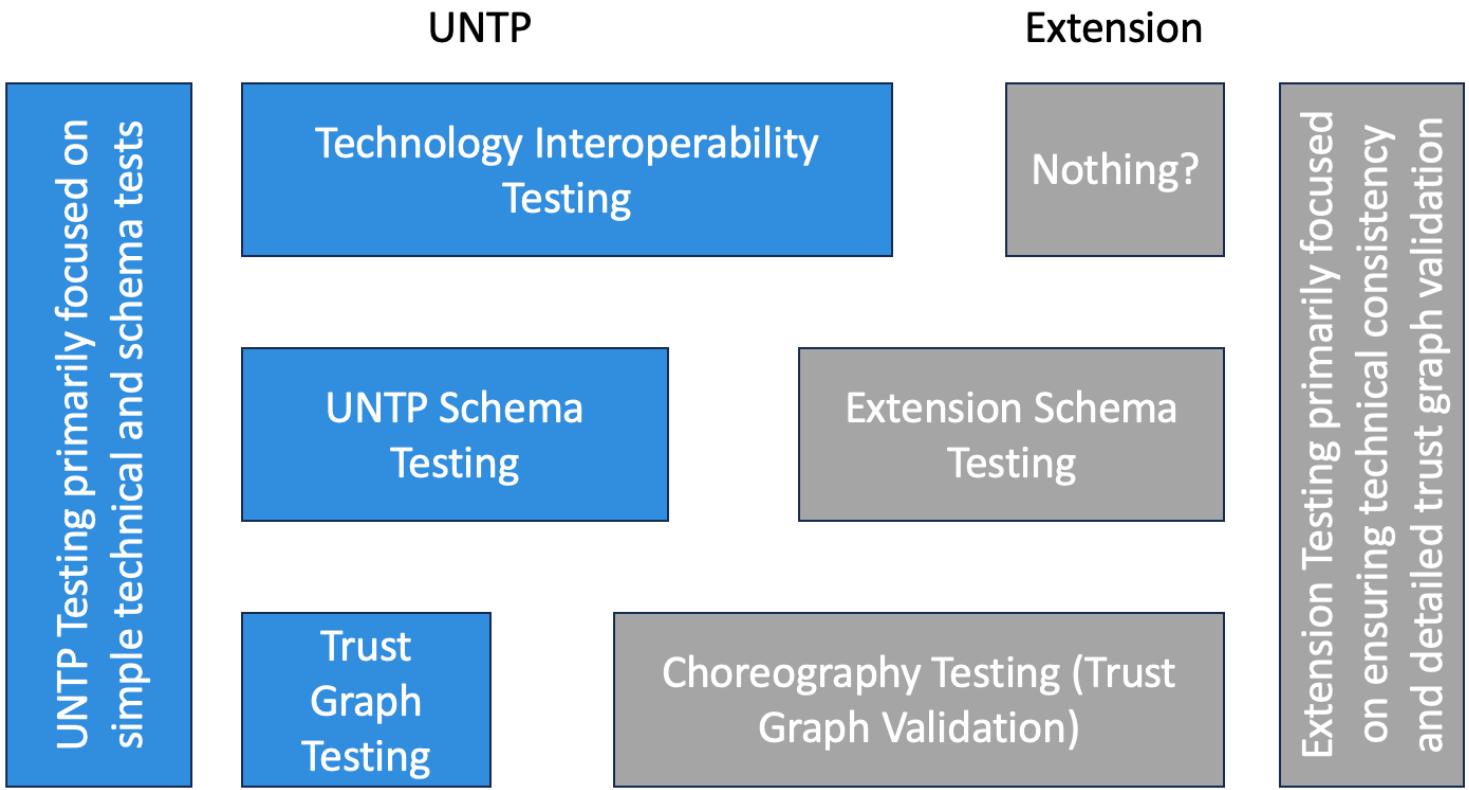
The playgrounds are hosted implementations of the full UNTP test service which can be deployed locally

Test documentation URL: <https://uncefact.github.io/tests-untp/>

3 Tier Test Architecture

There is a 3 tier testing architecture to help implementors ensure that they are issuing UNTP interoperable digital product passports. This architecture also ensures that as implementors 'extend' the UN Transparency Protocol they do that in a non-

breaking fashion.



At each tier we articulate the specific testing for UNTP and for an extension.

UNTP Testing (the blue sections in the diagram)

The UNTP testing is intended to provide implementors the ability to validate that they have a complete valid reference implementation of UNTP. This testing gives a starting point so that implementers know that their implementation is starting as UNTP compliant and that any extensions that they make need to have validations added to ensure continued UNTP interoperability.

Tier 1: UNTP Test: Technology Interoperability Testing

This testing is intended to provide implementers confidence that the technical implementation is correct. It is primarily focused on W3C verifiable credential compliance.

Tier 2: UNTP Test: UNTP Schema Testing

This tests that the schema that are being used to issue credentials are a valid UNTP schema. This will enable an implementor to validate that they are starting with a valid UNTP set of schema.

Tier 3: UNTP Test: Trust Graph Testing

This validates that the links between the different components of the UNTP schema (DPP, DTE, DCC) are validated. It is anticipated that this is relatively simple at generic UNTP level, but will get more involved for each extension.

Extension Testing (grey boxes)

UNTP has been designed so that each industry and jurisdiction can extend UNTP to meet their specific business, governance and community needs. In order to ensure that supply chain customers downstream can consume details from their upstream supply chain partners - it is important that extensions maintain UNTP compliance. Extension testing is intended to provide that confidence to implementors.

Tier 1: Extension Test: Nothing?

It is expected that there won't be changes at Tier 1 of the testing architecture for extensions. This is because we are using W3C standards and if there are requirements for extensions it is beyond the scope of UNTP to manage. We are including it in the architecture to facilitate future unforeseen needs.

Tier 2: Extension Test: Extension Schema Testing

This testing is designed to ensure that as implementors are extending UNTP schema (DPP, DTE, DCC) to meet their specific needs that they are not breaking compatibility with UNTP and that they are able to provide the implementors of their extensions with confidence that their extension is correct.

Tier 3: Extension Test: Choreography Testing (Trust Graph Validation)

This provides the ability for extendors to map the different credentials together to validate specific industry or regional scenarios. In Australia NATA is the national accreditor for laboratories - so the link from NATA to an accredited laboratory to a specific accreditation would be validated by a test in this component.

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Implementation Support

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Reference Implementation

The following tools make up a reference implementation.

Tool	Link	Description	Status
Project VC Kit	https://github.com/uncefact/project-vckit	This is a tool that verifies and issues credentials.	Active Development
Mock Apps	https://github.com/uncefact/tests-untp/tree/next/packages/mock-app	Tool to build testable supply chain implementations to enable testing and validation of your DPPs and supply chain	Active Development
Identity Resolver	https://github.com/uncefact/project-identity-resolver	Tool that enables to go from the identifier to more information about the identified object including a DPP	Active Development
UNTP Test Suite	https://github.com/uncefact/tests-untp/tree/next/packages/untp-test-suite	Provides tooling for implementers to validate their DPP's across the 3 tiers (correct credential, correct schema, and correct choreography)	Active Development

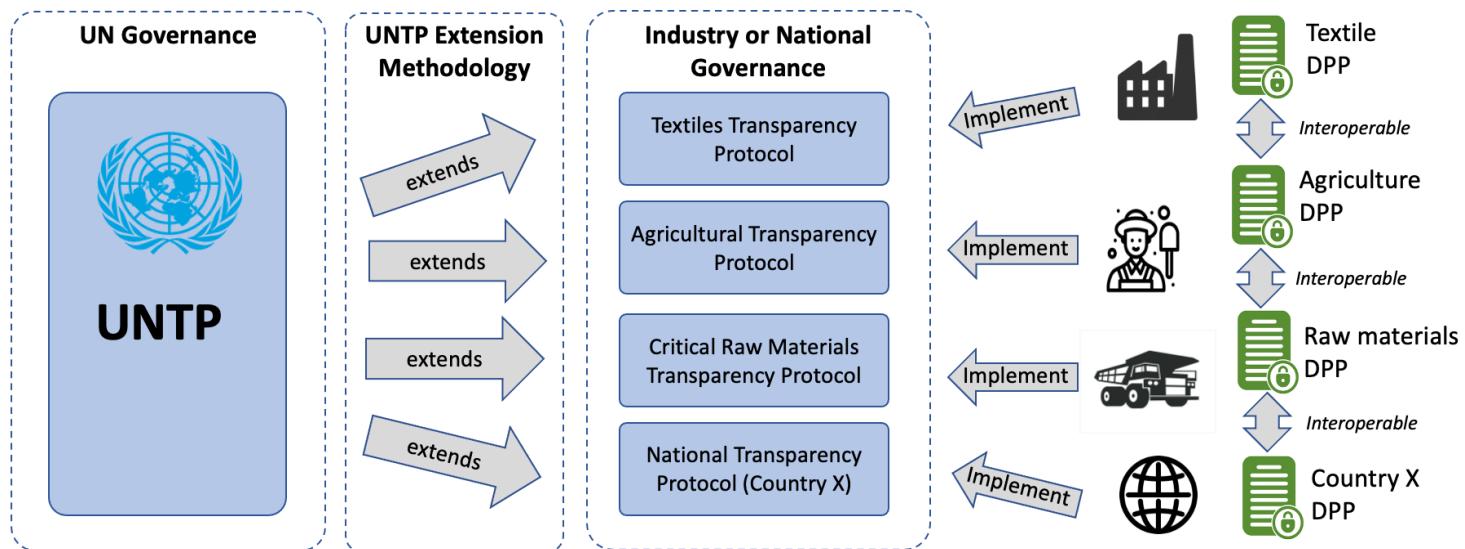
Extensions Register

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Extensions Methodology

UNTP is designed as a common core that is usable by any industry sector or in any regulatory jurisdiction. This extensions methodology describes how to extend UNTP to meet the specific needs of any industry sector or regulated market in such a way that the extension maintains core interoperability with any other extension. This cross-industry and cross-border interoperability is a core value of UNTP because almost every value chain will cross industry and/or national borders.



Anyone can take UNTP and extend it for any purpose. But for the extension to be registered as UNTP conformant, an extension **MUST** remain interoperable with UNTP. This is achieved by following the governance, methodology, and testing processes described on the [Extensions Methodology Page](#)

Extensions Register

The UNTP project maintains a list of registered [industry and/or geography specific extensions](#).

In some cases, UNTP extensions are themselves UN projects - such as the extensions defined by the [UN critical raw materials traceability and transparency project](#). In most cases however, industry sectors and/or national projects will govern their own extensions.

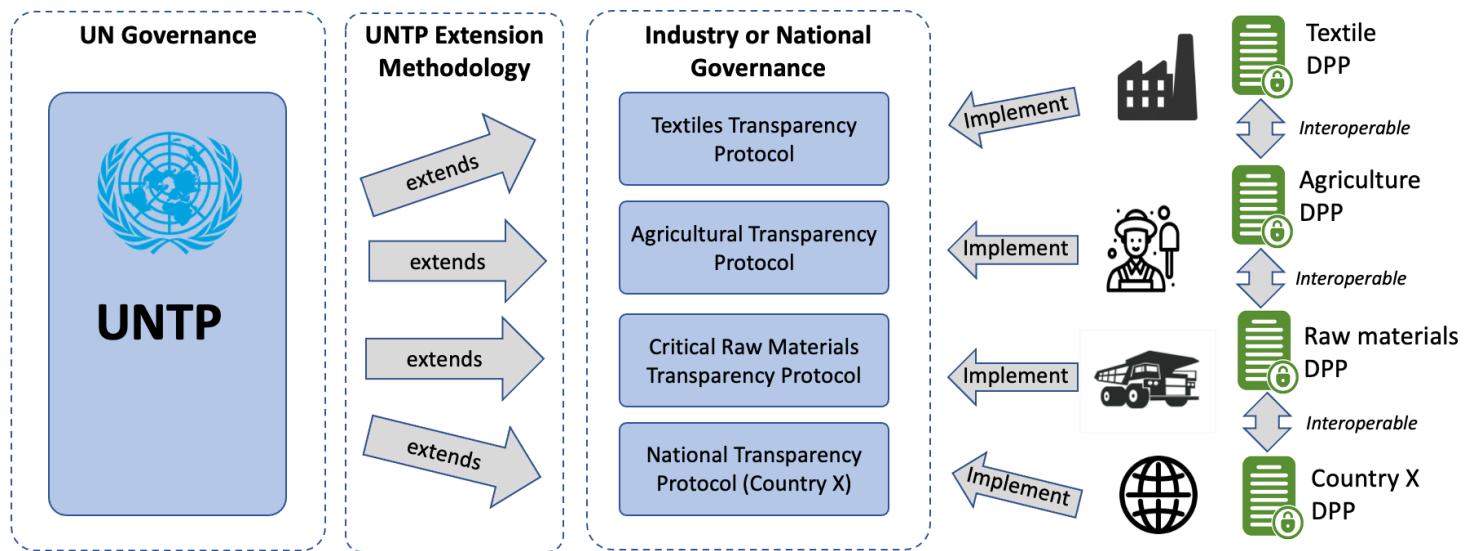
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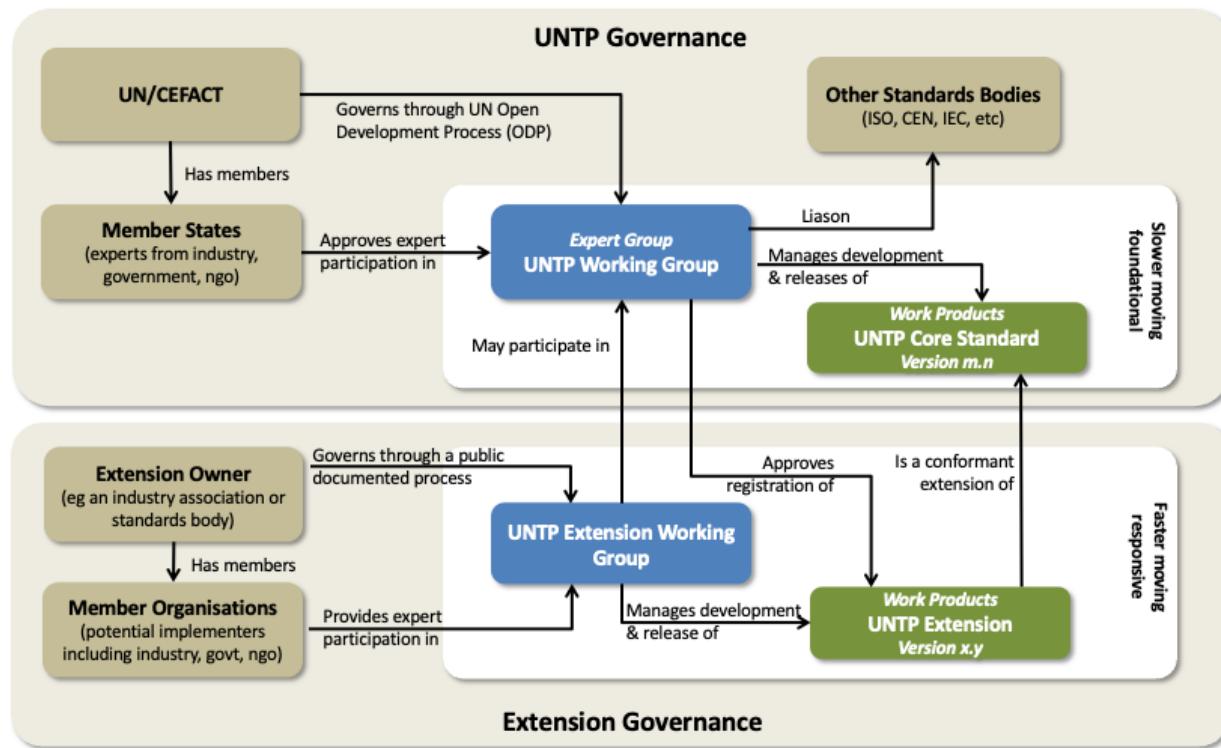


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Extension Governance

As shown in the diagram below, UNTP development follows the UN/CEFACT Open Development Process (ODP) and is maintained by a group of experts that are approved by their member state delegate. UNTP Intellectual Property is owned by the UN and the standard is available free for anyone to use. There are formal liaisons with other standards bodies including ISO so that UNTP remains aligned with similar initiatives.



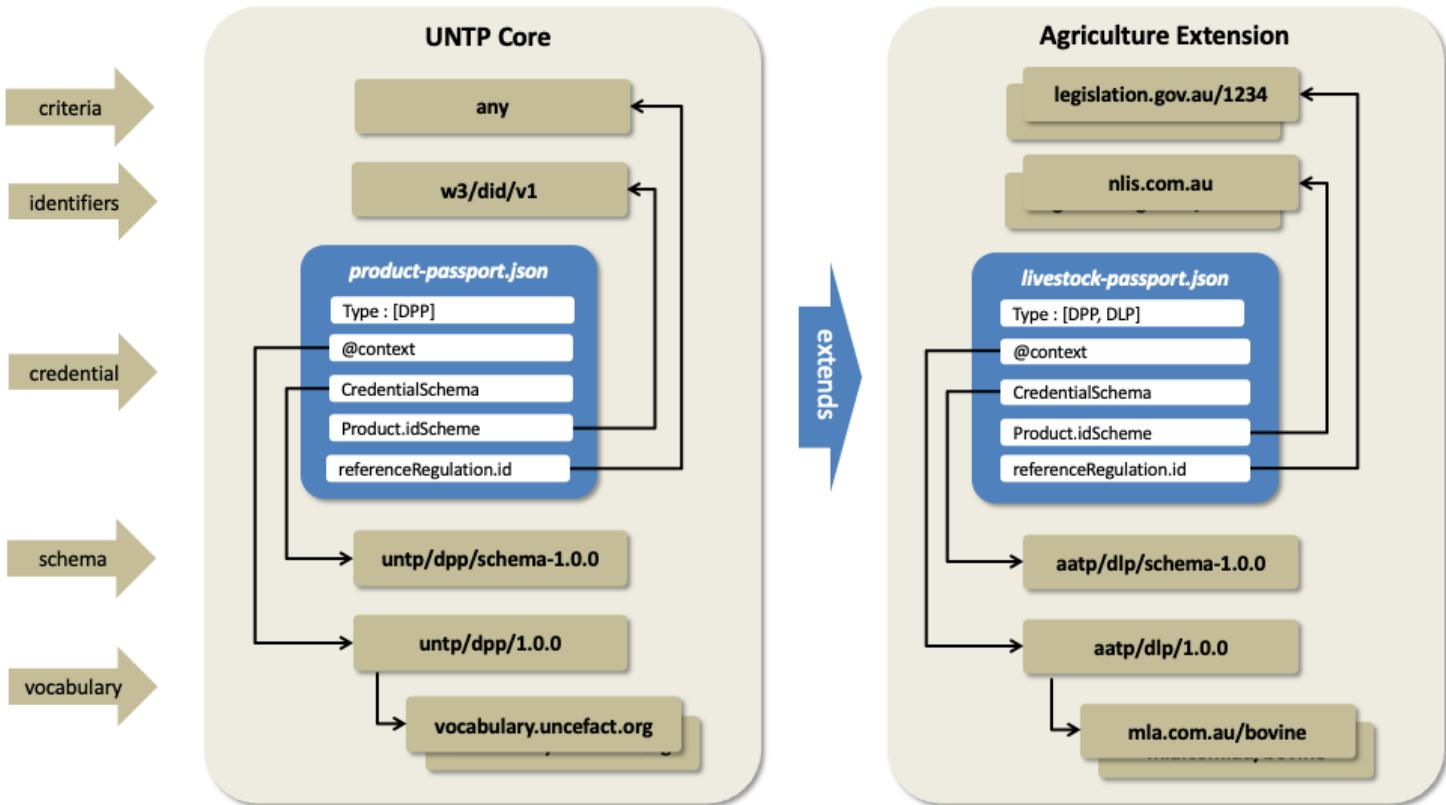
Registered UNTP extensions

- MUST follow an open and transparent development process that is open to participation from representative persons and organisations.
- MUST be freely available under a permissive or creative commons license.
- MUST be version managed (major.minor) and each extension version MUST state which UNTP major version from which it is derived.
- MUST be documented as a public website with reference-able URI for each specification component.

Since registered extensions have a clear vested interest in the ongoing development of UNTP, extension working groups SHOULD nominate at least one member as a participant in the UNTP working group.

Extension Methodology

UNTP extensions must be interoperable with UNTP core. This means that a credential that conforms to a UNTP extension is also conformant with UNTP core. This requirement ensures that credentials issued in a specific industry or geographical context are still understandable across industry or geographic boundaries.



Schema Extensions

UNTP credential JSON schema allow additional properties in most objects to provide flexibility to accommodate industry extensions.

- UNTP extensions MAY define any number of variants to UNTP schema. For example an agriculture extension may define both a livestock passport and a horticulture passport as extensions of the UNTP digital product passport.
- UNTP extension schema MUST NOT redefine any properties in UNTP schema.
- UNTP extension instances MUST validate against both the extension schema and the corresponding UNTP core schema.

Vocabulary Extensions

Industry extensions will often leverage existing industry specific vocabularies. For example an agriculture extension may reference terms from [Codex Alimentarius](#). This is achieved through JSON-LD `@context` files.

- Each credential defined by a UNTP extension MUST reference a JSON-LD `@context` file that defines all additional terms.
- JSON-LD `@context` files defined by a UNTP extension MUST NOT redefine terms in the corresponding UNTP `@context` file.
- External vocabularies referenced by UNTP extensions SHOULD be stable, version managed, and should not delete terms.

Identifier Schemes

UNTP and its extensions have a dependency on resolvable and verifiable identifiers. Industry extension will typically define specific identifier schemes (for products, facilities, and organisations) that are relevant for the specific industry and/or geography. For example, Australian livestock are identified by a [National Livestock Identifier](#) that is carried as an RFID tag in the animal's ear.

- All identifier schemes used by registered UNTP extensions MUST be registered in the UNTP identifier scheme register.
- Identifiers used by UNTP extensions SHOULD be resolvable and verifiable as defined by the UNTP Identity Resolver specification.

Conformity Criteria

UNTP is deliberately agnostic of specific standards and regulations. The generic `Declaration` object that is used by DPP, DFR, and DCC credentials is designed to support any conformity criteria defined by any standard or regulation. UNTP extensions, however, will normally agree a specific set of standards and regulations that are applicable in the extension context.

- UNTP extensions MUST list all relevant standards and regulations on the extension specification website.
- The specific conformity criteria within Standards and Regulations referenced by UNTP extensions SHOULD be referenceable as stable URIs.

Extension Conformity Testing

TBC

Extensions Register

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Please note that this content is under development and is not ready for implementation. This status message will be updated as content development progresses.

Extensions Register

Summary list of registered UNTP Extensions

Extension Name	Extension Owner	Geographic Scope	Industry Scope	Status
Responsible Business Transparency Protocol (RBTP)	Responsible Business Alliance	Global	Electrical, electronic & automotive parts	new
Universal Data Protocol (UDP) for the Global Built Environment	Standards Australia and the International Code Council	Global	Construction	new
Australian Agriculture Traceability Protocol (AATP)	Food Agility CRC	Australia	Agriculture	draft
UN Critical Raw Materials Transparency Protocol (CRMTP)	UN/CEFACT	Global	Critical minerals mining & processing	dormant
Global Battery Alliance Transparency Protocol	GBA	Global	Battery Manufacturing and Value Chains	draft
International Copper Association Transparency Protocol (ICATP)	ICA	Global	Copper mining & processing	draft

Extension Details

Responsible Business Transparency Protocol

- Extension Launched: Nov-2024
- Release Date: TBA
- Industry: Electrical, electronic & automotive
- Geography: Global

Logo	Implementation Statement
	<p>The Responsible Business Alliance (RBA) is a coalition of companies driving sustainable value for workers, the environment and business throughout the global supply chain. Our members, suppliers and stakeholders collaborate to improve working and environmental conditions and business performance through leading standards and practices. Transparency and traceability in value chains is key to building confidence and value of sustainable business practices. Accordingly, the RBA is pleased to build upon the foundational capabilities provided by the UN Transparency Protocol (UNTP) to deliver a suite of interoperability standards for the electrical and electronic goods and automotive parts industries.</p>

Credential Extensions

Credential	Description	Extension of
Responsible Minerals Initiative Credential (RMIC)	A conformity credential attesting to the responsible sourcing of minerals in supply chains.	Digital Conformity Credential
Responsible Labour Initiative Credential (RLIC)	A conformity credential attesting that the rights of workers vulnerable to forced labor in global supply chains are consistently respected and promoted.	Digital Conformity Credential
Responsible Environment Initiative Credential (REIC)	A conformity credential attesting to the performance of a facility in the areas of Decarbonization, Chemical Management, Water Stewardship, and Circular Materials	Digital Conformity Credential
Responsible Factory Initiative Credential (RFIC)	A conformity credential attesting that a supplier facility meets the RBA Code of practice.	Digital Conformity Credential
Electrical Goods Passport (EGP)	A digital product passport tailored to the needs of electrical and electronic products and their conformity to Environmental, Social, and Governance standards.	Digital Product Passport
Digital Battery Passport (DBP)	A digital product passport that is designed to meet the needs of RBA members whilst also offering compliance with emerging EU standards.	Digital Product Passport

Credential	Description	Extension of
Electrical Facility Record (EFR)	A digital facility record tailored to the needs of manufacturing facilities in the electrical and electronic industry sectors and their sustainability performance.	Digital Facility Record

Universal Data Protocol for the Global Built Environment

- Extension Launched: Nov-2024
- Release Date: TBA
- Industry: Built Environment (construction)
- Geography: Global

Logo	Implementation Statement
 	<p>The Universal Data Protocol (UDP) is an extension of the UNTP and is seeking to leverage its decentralised framework to provide transparent, trustworthy, and verifiable data in the global built environment. The UDP is an open protocol that will allow for the efficient exchange of verifiable data, enhancing reporting and compliance across jurisdictions and life cycle stages. This project seeks to improve the interoperability of data across the built environment, aiming to make reporting more cost effective, accurate and efficient for all stakeholders.</p>

Credential Extensions

Credential	Description	Extension of
Built Environment Vocabulary	Catalog of sustainability criteria for the built environment	SVC

Australian Agriculture Traceability Protocol

- Extension Launched: Feb-2024
- Website : <https://aatp.foodagility.com/>
- Release Date: TBA
- Industry: Agriculture
- Geography: Australia

Logo	Implementation Statement
	<p>The AATP is an adaptation of the UN Transparency Protocol and is designed to help Australian producers meet emerging environmental, social, and governance (ESG) regulatory and consumer</p>

Logo	Implementation Statement
	requirements. Operating as a governance framework, the AATP facilitates the interaction between multiple certifiers, farm systems, and enterprise systems. Interoperability and traceability tools help the Australian agriculture sector attain higher quality information about the value of Australian-made products.

Credential Extensions

Credential	Description	Extension of
Digital Livestock Passport	Quality and sustainability characteristics of cattle including bovine characteristics and veterinary treatment history	DPP
Deforestation Credential	A farm-level attestation of conformity to EU Deforestation Regulation	DCC

Critical Raw Materials Transparency Protocol

- Extension Launched: Jan-2024
- Release Date: TBA
- Industry: Critical Minerals Mining & Processing
- Geography: Global

Logo	Implementation Statement
	In line with the United Nations (UN) Sustainable Development Goals (SDGs) and building on the success of the UNECE Textile & Leather traceability project, this project seeks to empower the Critical Raw Material (CRM) industry with practical, low cost tools for digital data exchange to achieve product differentiation, maximize the value of existing permitting and ESG compliance efforts, counter green-washing, and support a more sustainable global economy. This project supports the UN focus on extractive industries and leverages the UN Center for Trade Facilitation and Electronic Business' (UN/CEFACT) role and capabilities to deliver digital standards for sustainable supply chains.

Credential Extensions

Credential	Description	Extension of
Copper Passport	Quality & sustainability characteristics of copper concentrate	DPP

Credential	Description	Extension of
TSM Credential	Towards Sustainable Mining Mine-site sustainability performance credential	DCC

Global Battery Alliance Transparency Protocol

- Extension Launched: Jun-2025
- Release Date: TBA
- Industry: B.7 - mining of metal ores, C.24 - manufacture of basic metals, C.2720 - manufacture of batteries and accumulators.
- Geography: Global

Logo	Implementation Statement
	The Global Battery Alliance is the leading multistakeholder organisation for sustainable, transparent and resilient battery supply chains. The organisation's flagship initiative, the Battery Passport, leverages digital product passport technology to create harmonised data exchange, reporting, compliance and sustainability certification frameworks for companies in the battery supply chain worldwide.

Credential Extensions

Credential	Description	Extension of
Digital Battery Passport (DBP)	A digital product passport for battery supply chain transparency, sustainability performance measurement and due diligence, including for EU regulatory reporting.	Digital Product Passport
Battery Sustainability Certificate	A digital certificate attesting that a battery has met GBA requirements to be issued sustainability certification.	Digital Conformity Credential
Carbon Calculation Certificate (CCC)	A digital certificate attesting that a site/facility has correctly calculated its associated carbon emissions in line with the GBA Greenhouse Gas Rulebook.	Digital Conformity Credential
Digital Site / Facility Report (DSR)	A digital report produced by sites and facilities in the battery supply chain, with data aligned to GBA Battery Passport reporting requirements.	Digital Product Passport
Site/Facility Verification Credential (SVC)	A conformity credential attesting that a site/facility in the battery supply chain has conformed to GBA rules for data reporting, aggregation and exchange, subsequent to verification by an Approved Verifier.	Digital Conformity Credential

Credential	Description	Extension of
Approved Verifier Credential (AVC)	A conformity credential attesting that a provider of 3rd-party verification services is approved to conduct verification and issue SVCs.	Digital Conformity Credential
Approved Certifier Credential	A conformity credential attesting that a provider of 3rd-party certification services is approved to conduct certification and issue BSCs.	Digital Conformity Credential
Approved Carbon Calculation Partner Credential	A conformity credential attesting that a provider of 3rd-party carbon calculation services is approved to offer carbon calculation services and issue CCCs.	Digital Conformity Credential

International Copper Association Transparency Protocol

- Extension Launched: Jun-2025
- Website: <https://internationalcopper.org/>
- Release Date: TBA
- Industry: Copper Mining

Logo	Implementation Statement
 International Copper Association	<p>The International Copper Association (ICA) promotes copper, protects its markets, and defends and sustains copper demand as the superior material to address global challenges like electrification, urbanization and digitalization. ICA members are industry leaders in responsible modern production and through ICA come together to address stakeholder questions around product environmental footprint, circularity and responsible production and use to maintain access to markets and promote copper as the material of choice. The copper extension to the UNTP will help copper producers to better demonstrate their responsible production practices and environmental performance and build trust in the copper supply chain.</p>

Credential Extensions

Credential	Description	Extension of
Copper Passport	Quality & sustainability characteristics of copper concentrate	DPP
Coppermark Credential	Coppermark Copper sustainability performance credential	DCC

