W3C TPAC breakout session

Updates on the "Trustable Internet" project

September 13, 2023

Trusted Internet Architecture Lab.

Agenda

- Overview of the Session
  - Objective
    - To present updates for the "Trustable Internet" project and discuss standardization aspects
    - To obtain feedback on the project's activities and find out possibilities of standardization on some of the components used in the overlay architecture
- 1. About "Trustable Internet" (4 min.)
- 2. A demonstration of the system(6 min.)
- 3. Data model (10 min.)
- 4. Necessity of standardization (5 min.)
- 5. Open discussion (30 min.)
- 6. Wrap-up (5 min.)

1. About "Trustable Internet"

Problem in the current Internet

- Lack of general methods to confirm the credibility of information from various viewpoints

References: Trustable Internet White Paper Version 1.0

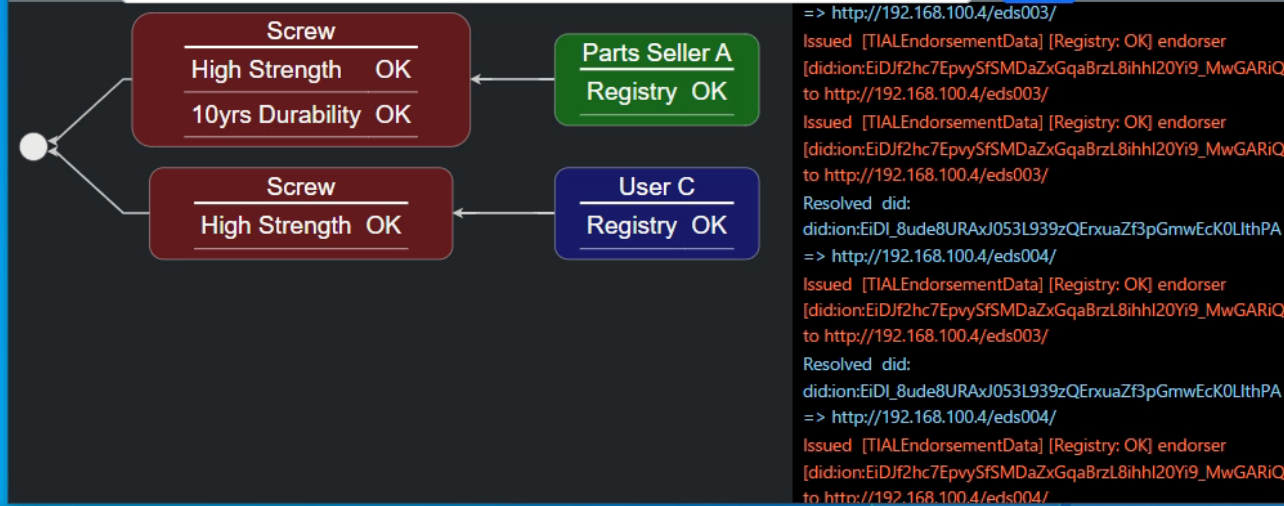Trustable_Internet_Whitepaper_V1.0.pdf (keio.ac.jp)

Summary of "Trustable Internet"

- Our Proposal
    - Mechanism allowing evidence (Endorsement) to be linked to information
    - This mechanism allows viewers to confirm the credibility of the information by considering the source of the attached evidence.

- Use cases
    - Preventing the spread of misinformation on social networking sites (SNS)
    - Improving the credibility of merchandise in E-commerce (EC)

2. A demonstration of the system (in IETF 116)

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Endorsement Graph

DID did:ion:EiBQNZlEfZ0iXvNgi02F9dKPkR4nRkyG3SXzXhRU1bsthA:eyJkZWx0YSI6eyJwYXRjaGV... [view]

Screw	
High Strength	OK
10yrs Durability	OK

Parts Seller A
Registry OK

Screw	
High Strength	OK

User C
Registry OK

=> http://192.168.100.4/eds003/
Issued [TIALEndorsementData] [Registry: OK] endorser [did:ion:EiDJf2hc7EpvySfSMDaZxGqaBrzL8ihhI20Yi9_MwGARiQ] to http://192.168.100.4/eds003/
Issued [TIALEndorsementData] [Registry: OK] endorser [did:ion:EiDJf2hc7EpvySfSMDaZxGqaBrzL8ihhI20Yi9_MwGARiQ] to http://192.168.100.4/eds003/
Resolved did: did:ion:EiDI_8ude8URAxJ053L939zQErxuaZf3pGmwEcK0LlthPA => http://192.168.100.4/eds004/
Issued [TIALEndorsementData] [Registry: OK] endorser [did:ion:EiDJf2hc7EpvySfSMDaZxGqaBrzL8ihhI20Yi9_MwGARiQ] to http://192.168.100.4/eds003/
Resolved did: did:ion:EiDI_8ude8URAxJ053L939zQErxuaZf3pGmwEcK0LlthPA => http://192.168.100.4/eds004/
Issued [TIALEndorsementData] [Registry: OK] endorser [did:ion:EiDJf2hc7EpvySfSMDaZxGqaBrzL8ihhI20Yi9_MwGARiQ] to http://192.168.100.4/eds004/

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Endorser: User D

https://192.168.100.4:8080

PR PARTS RETAIL STORE   [All ▾] [Search]

Today's Deals | Customer Service | Registry | Gift Cards

Industrial > Fasteners > Screws > Titanium Screws

SNG Company
TPH-901 : Titanium Pan Head Machine Screw for Precision Instruments (100pcs)
★★★★★ (168 reviews)
[High-Strength] [10yrs-Durability] [Weight-Saving] [Non-Magnetic] RoHS compliant 22 Ti Titanium

Specifications & Price

Model Number	M	Pitch	L	D1	L1	Max. torque (N·m)	Weight(g)	Lot (pcs)	$Price	Delivery
TPH-901-M1.6-3	M1.6	0.35	3	2.3	0.5	0.07	0.023	100	$20.98	2-3 Days
TPH-901-M1.6-4	M1.6	0.35	4	2.3	0.5	0.07	0.028	100	$22.98	2-3 Days

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Data Viewer: User B

🌐 Parts Sales Site ✕ +

← → C ⌂ ⚠ 保護されていない通信 | https://192.168.100.4:8080

PR PARTS RETAIL STORE   [All ▾] [Search]

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3. Data model

Endorsement for confirming content credibility

- In order to confirm the credibility of Web content, a data model consists of the following:
  - Evidence (Endorsement) of the credibility of Web content
  - Identifier of the evidence provider (Endorser)
  - Identifier of web contents (Endorsee)

- In order to enable Endorsements to be added and viewed by various services, it is necessary to realize them in a way that does not depend on specific services.

- Therefore, it is necessary to implement Endorsement by overlaying existing Web content.
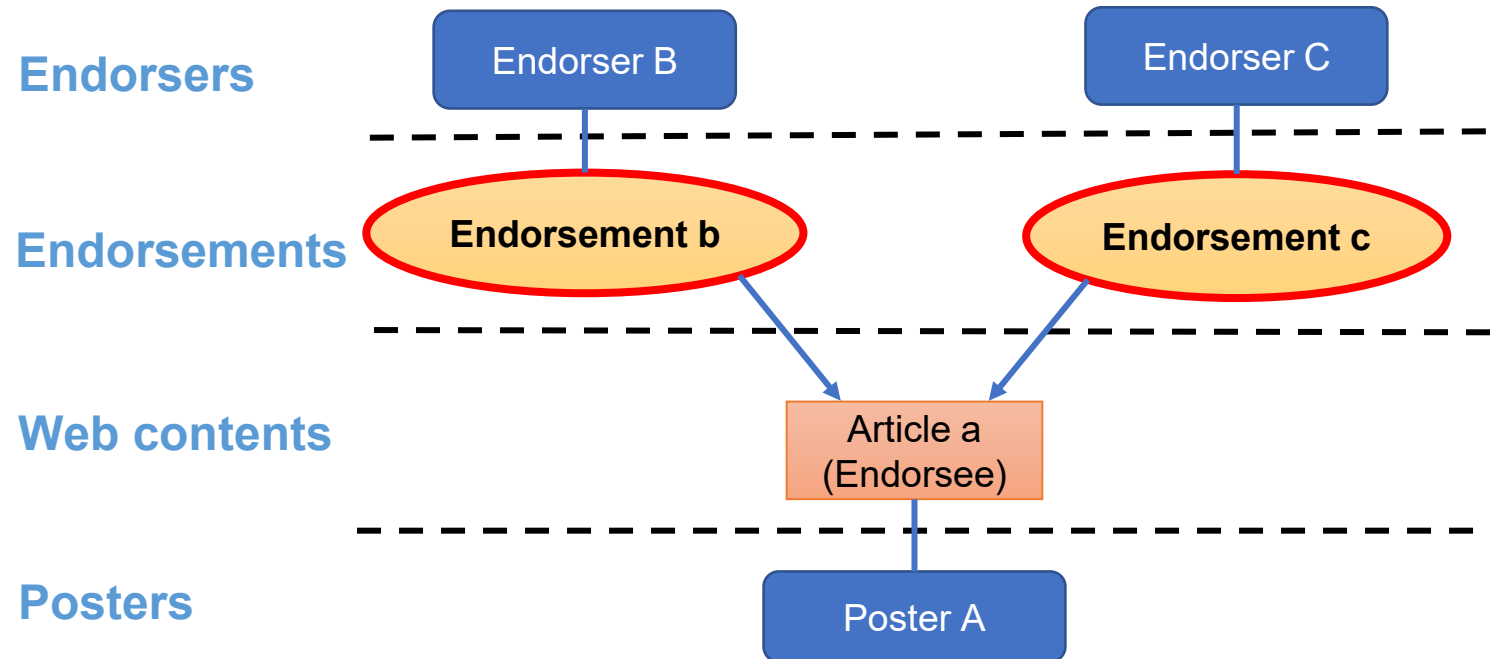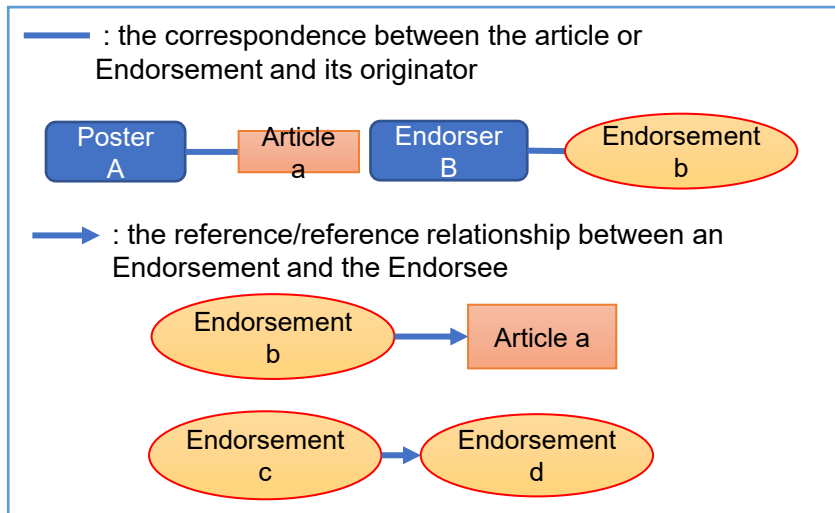
Endorsement data structure

Key		Type	Explanation of the value	Mandatory/Optional
Endorsement ID		URI	Identifier of Endorsement	Mandatory
Endorsee ID		URI	Identifier indicating the target of the Endorsement(Endorsee)	Mandatory
Creation date		DateTime	Date and time the Endorsement was created	Mandatory
Hash		String	A hash value of the entire content (SHA256) indicated by the Endorsement ID	Mandatory if Endorsee ID type is URL
Endorser ID		DID	Identifier of the Endorser issuing the Endorsement	Mandatory
Claims	Target	URI	The scope to which the claim refers in the Endorsee	Optional if the Target is the entire Endorsee ID
	Property	Any	Claims made by the Endorser regarding the target	

Example of Endorsement (1)

- The case in which an individual views a social media post and attaches an Endorsement

Endorsement	
Key	Value
Endorsee ID	https://twitter.com/kuron_nano/status/1574121450860007424
Creation date	2022-09-27
Hash	abdc01cfd6be099d49dcf7d5ee0d3c72d1cc8ef9b0b62be81d2b775a66bf1ccc
Endorser ID	did:example:entity000
Claims	About	Flood damage
	Start Date	2022-09-26
	Location	Shimizu ward, Shizuoka City, Shizuoka Prefecture

Expression of Endorsement expanding VC

```
{
  "@context": [
    "https://www.w3.org/2018/credentials/v1",
    "https://schema.org"
  ],
  "id": "http://example.com/endorsements/58473",
  "type": ["VerifiableCredential", "VerifiableEndorsement"],
  "issuer": "did:example:entity000",
  "issuanceDate": "2022-09-27T10:00:00Z",
  "credentialSubject": {
    "type": ["Event", "MediaObject" ],
    "id": "https://twitter.com/kuron_nano/status/1574121450860007424",
    "sha256": "abdc01cfd6be099d49dcf7d5ee0d3c72d1cc8ef9b0b62be81d2b775a66bf1ccc",
    "about": {
      "type": "Thing",
      "name": "Flood damage"
    },
    "startDate": "2022-09-26+09:00",
    "location": {
      "type": "Place",
      "address": "Shimizu ward, Shizuoka City, Shizuoka Prefecture"
    },
  },
  "proof": { ... }
}
```

Example of Endorsement (2)

- The case that an individual attaches an Endorsement to **a portion of an image** in the social media post

Endorsement		
Key		**Value**
Endorsee ID		https://twitter.com/kuron_nano/status/1574121450860007424
Creation date		2022-09-27
Hash		0db2f801b5cda5dbda39290c13c2b7920ab8cf5fe22e7a18884fc7fd764ba9c1
Endorser ID		did:example:entity001
Claims	Target	https://twitter.com/kuron_nano/status/1574121450860007424/photo/1#xywh=aa,bb,cc,dd
	Media Authenticity Category	Edited or cropped content

Expression of Endorsement expanding VC and web annotation

```
{
  "@context": [
    "https://www.w3.org/2018/credentials/v1",
    "https://schema.org"
  ],
  "id": "http://example.com/endorsements/58474",
  "type": ["VerifiableCredential", "VerifiableEndorsement"],
  "issuer": "did:example:entity001",
  "issuanceDate": "2022-09-27T10:00:00Z",
  "credentialSubject": {
    "type": ["MediaReview", "MediaObject"],
    "id": "https://twitter.com/kuron_nano/status/1574121450860007424",
    "target":"https://twitter.com/kuron_nano/status/1574121450860007424/photo/1#xywh=aa,bb,cc,dd",
    "sha256": "0db2f801b5cda5dbda39290c13c2b7920ab8cf5fe22e7a18884fc7fd764ba9c1",
    "mediaAuthenticityCategory": "EditedOrCroppedContent",
    "url": "https://twitter.com/kuron_nano/status/1574121450860007424/photo/1"
  },
  "proof": { ... }
}
```

4. Necessity of standardization

- We applied the Web Annotation as an identifier to point to a portion of text or images.

- However, the Web annotation lacks the function to uniquely identify the Endorser's intended Endorsee in the following cases:
  - Endorsee(e.g., a portion of text of images in a social media post) can be updated by the Endorsee's poster.
  - Endorsee can be pointed using Endorsee's Non-permanent links (e.g., URL of a social media timeline).

- Therefore, the following standardization extending web annotation is necessary:
  - How to include timestamps in web annotations
  - How to express the permanent link for each Endorsee

5. Open discussion

- Feedback for Trustable Internet
  - Concept, data model
- Towards standardization
  - Related technology, use case, ecosystem
  - Related standards
    - e.g., Web Annotation
  - How to imperilment Endorsement storage and discovery

- Goal
  - To obtain feedback on the project's activities and find out possibilities of standardization on some of the components used in the overlay architecture

6. Wrap-up

- Overview of the Session
  - Objective
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    - To obtain feedback on the project's activities and find out possibilities of standardization on some of the components used in the overlay architecture

- 1. About "Trustable Internet" (4 min.)

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Backslides

Linking real world endorsement to data on the Internet

- Demonstration settings
  - Mr. B is browsing the product information of the parts made by Company A on the parts sales site.
  - Mr. B wants to know the credibility of the information that the part is "High-Strength. "
  - When Mr. B can see the endorsement from Mr. D, **whom he knows well**, the information that the part is "High-Strength" becomes more credible to Mr. B.
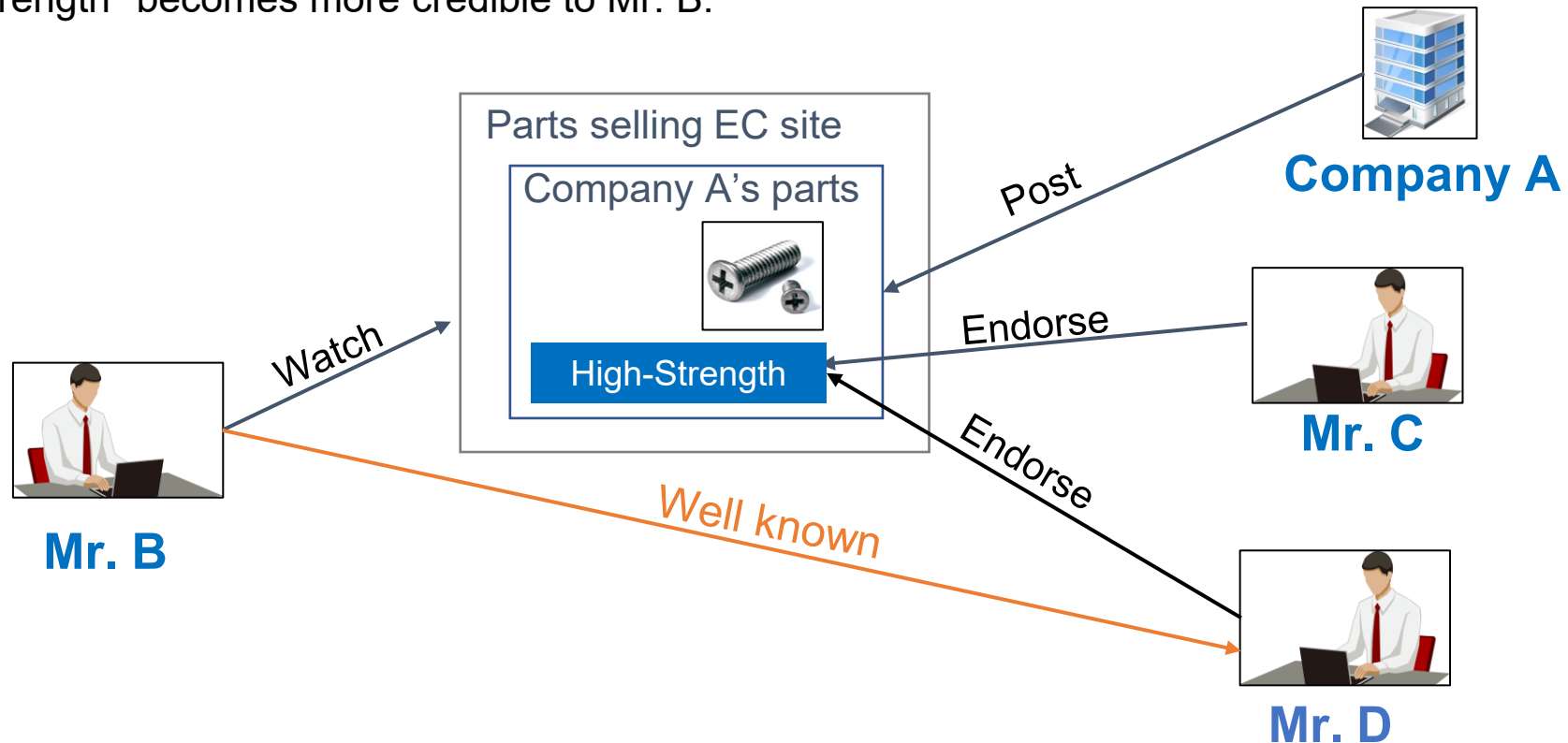
Partial pointing of text and images

- Cutting out and pointing a portion of text or images to clarify the target of each Endorsement
    - Allowing the Endorser to represent the intended subject of the Endorsement accurately
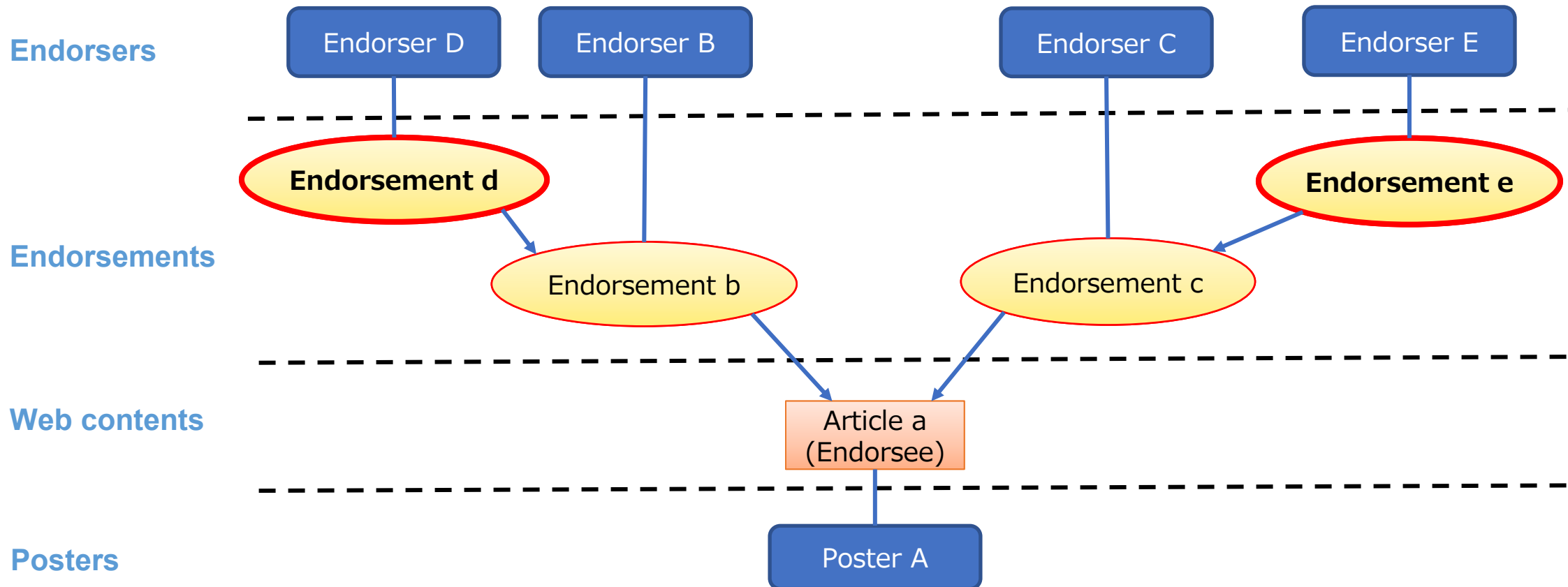

Endorsement to a portion of text

Endorsement to a portion of the image

Endorsement for Endorsement

- Endorsements for Endorsements can be attached as well as Endorsements for Web content.

Endorsement when content is updated

- After Web content is updated, attached Endorsements may also need to be updated.

- Endorsements for Endorsements may also need to be updated considering modification of endorsements.

- When new endorsements are no longer attached to Web content, the evaluation of the Web content is determined.
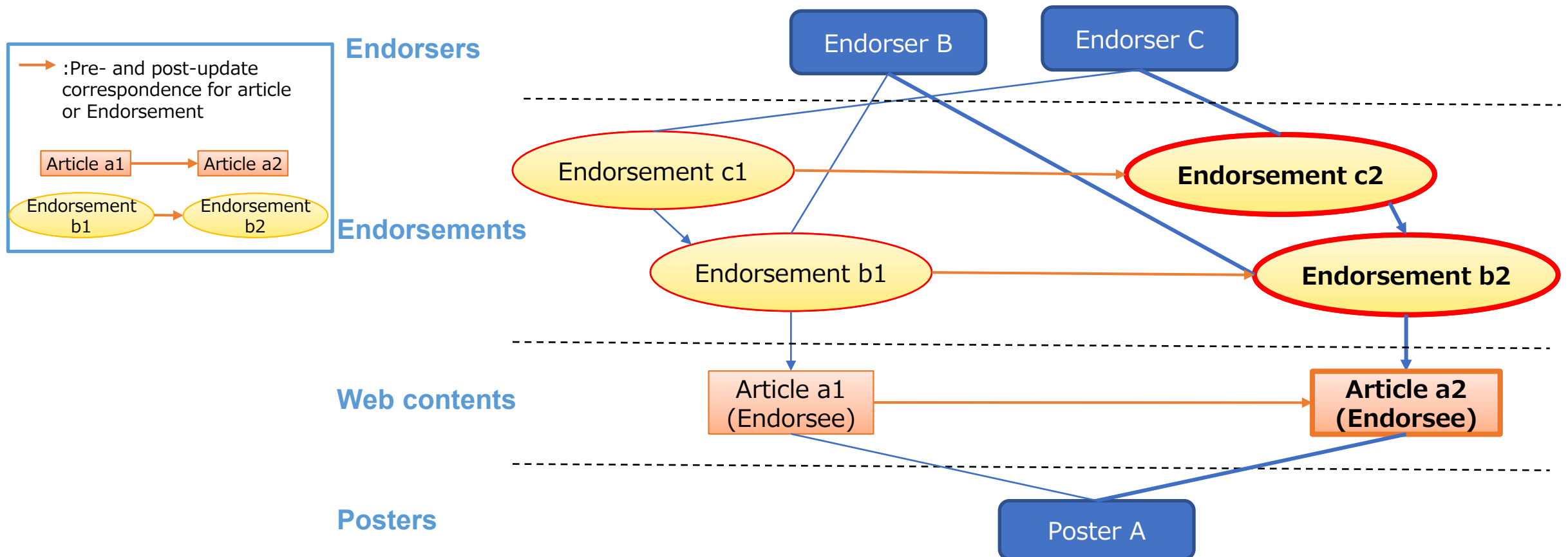
Identifier requirements in the Endorsed data structure

ID name	Requirements	Example of identifier matching requirements
Endorsement ID	Pointing an Endorsement by globally unique identifier	URI
Endorsee ID	Pointing information in the web page (e.g., text or images) by globally unique identifier	URL
	Pointing an entity (e.g., human, organization, or thing) by globally unique identifier	DID
	Pointing an endorsement by globally unique identifier	URI
Endorser ID	Pointing an entity (e.g., human, organization, or thing) by globally unique identifier	DID