

Position Paper

2026 January

TDM opt-out solutions

Overview

Bitkom participated in the Stakeholder's consultation aimed at supporting the implementation of the Measure 1.3 of the General-Purpose AI Code of Practice's Copyright Section. As a business association, Bitkom responded to the questions on technical TDM opt-out solutions based on feedback from members that express rights reservations in a machine-readable format for publicly available online content pursuant to Article 4(3) of the DSM Directive.

Technical TDM opt-out solutions

Our members have experience with the following technical opt-out solutions identified in the EUIPO study on the Development of Generative AI from a copyright perspective (beyond the robot exclusion protocol which is covered by point I(a) of Measure 1.3 of the Code):

Technical Solution	Yes/No
TDM reservation protocol (TDMRep)	Yes
C2PA TDM Assertions	Yes
AI.txt	Yes
Do not train registry (Spawning AI)	Yes
JPEG Trust core foundation V2	Yes
TDM.ai protocol (Licium)	Yes
Open Rights Data Exchange (Valunode)	Yes

Assessment of each technical solution

Technical Solution	Assessment
TDM reservation protocol (TDMRep)	TDMRep lacks formal standardization (not a W3C spec) and is governed by a narrow stakeholder set, which weakens neutrality and roadmap certainty. Reported adoption is very low (<3%), so network effects and tooling support are minimal. Technically, it provides binary, blanket signaling and cannot differentiate by crawler or purpose, risking conflicts with existing, granular robots.txt directives and creating ambiguity for crawler operators. Embedding static metadata makes signals easy to strip or alter; reliance on external policy URLs introduces additional failure points and operational fragility. At scale, these factors likely lead to stale or fraudulent rights data, inconsistent compliance, and higher maintenance overhead
C2PA TDM Assertions	C2PA is designed for provenance, not legal rights. Repurposing it to carry rights/opt-outs confirms who signed, but not whether the signer owns the rights—especially problematic for composite or nested assets. Assertions are static and frequently removed in the wild (e.g., widespread metadata stripping), causing ‘metadata decay’ and coexistence of conflicting rights claims. Mandating such signing can force creators to link personal identifiers to works, raising privacy concerns. Adoption for this use case appears negligible; category design reportedly overshoots the AI Act’s GPAI training scope and clashes with emerging standards, raising interoperability risk.
AI.txt	Centralized governance creates a single point of failure; reported outages show fragility for both rightsholders and developers. Functionally, AI.txt duplicates location-based blocking already available via robots.txt (including User-agent: * patterns widely used by major sites), adding no unique technical signal. Its taxonomy appears vague (e.g., ‘AI training’ vs ‘use in datasets’), risking legal ambiguity and conflicting directives when combined with robots.txt. Without clear additive value, AI.txt adds operational burden and the potential for contradictory instructions.
Do not train registry (Spawning AI)	A central registry is a systemic single point of failure; reported downtime makes continuous operation unreliable.

Technical Solution

Assessment

	Lookups add latency; per-item checks don't scale for web-wide ingestion. There is no robust identity or ownership verification; anyone could register third-party content, inviting fraud and disputes. Image-level opting depends on manual searches of limited corpora or browser extensions, neither verified nor scalable. It adds complexity without exceeding the granularity of robots.txt, while introducing integrity and performance concerns.
JPEG Trust core foundation V2	Still in development with limited public detail, so not deployable. Conceptually, it plans to embed CAWG-like assertions in image metadata and thus inherits the same weaknesses: static data, ease of stripping, and update challenges that yield conflicting or stale rights signals. Scope is confined to JPEG, making it incomplete for multimodal AI training (text, audio, video) or even for image ecosystems using other formats (e.g., PNG, WebP). Without live implementations and broad tooling, operational characteristics, interoperability, and compliance paths remain unknown.
TDM.ai protocol (Licium)	Relies on ISCC perceptual hashing, characterized here as outdated and collision-prone; at web scale, even modest error rates produce massive false positives/negatives. Similarity matching at open-web scale requires significant compute and infrastructure on both the rightsholder and developer sides; thresholds for equivalence are ill-defined, yielding unpredictable enforcement. While blockchain credentials might identify a signer, they don't validate legal ownership or resolve competing claims. Without strong governance and industry buy-in, the registry risks centralizing inaccurate rights data.
Open Rights Data Exchange (Valunode)	Early, untested, and unadopted; demos don't substitute for live, interoperable deployments. Blockchain can attest to signer identity but not to factual ownership or chain-of-title; without dispute resolution and transparent rightsholder processes, assertions can be incorrect or abused. Standardizing on any single fingerprinting method (e.g., ISCC) is technically brittle; the fingerprinting landscape is proprietary and evolving, making one-size-fits-all mandates risky. With no proven scale characteristics or sector adoption, practical implementability and compliance value remain speculative.

Degree of uptake of the solutions

Based on our knowledge all solution are used in a very limited manner (e.g. sporadic use in one or more specific sectors/for one or more content modality).

Information/data on the uptake of the specific solutions

Technical Solution

Degree of uptake

TDM reservation protocol (TDMRep)	<3% reported use; not a W3C standard; narrow governance. Binary controls conflict with granular robots.txt. Metadata can be stripped; external policy URLs add failure points — discouraging adoption.
C2PA TDM Assertions	Adoption 'statistically non-existent' (<50 signed images). Built for provenance, not ownership; can't validate IPR. Metadata often stripped (e.g., by publishers), causing 'metadata decay.' Privacy concerns further deter use.
AI.txt	Single-vendor control and outages create fragility. Adds no unique capability beyond robots.txt; vague taxonomy introduces legal ambiguity. With no clear added value, rightsholders stick to existing norms.
Do not train registry (Spawning AI)	Central registry downtime and lookup latency. No identity/ownership verification enables fraud. Manual URL /image-level processes are unscalable - offering no practical advantage over robots.txt.
JPEG Trust core foundation V2	Still in development; not in use. Inherits CAWG's metadata-stripping and update issues; JPEG-only scope makes it unsuitable for multimodal needs - limiting incentives to adopt.

Technical Solution

Degree of uptake

TDM.ai protocol (Liccium)	ISCC perceptual hashing flagged as collision-prone; similarity matching at web scale is compute-heavy and unreliable. Blockchain signer ≠ ownership proof; no conflict resolution - keeping adoption minimal.
Open Rights Data Exchange (Valunode)	Early, untested, unadopted. Blockchain asserts identity, not legal title; no dispute mechanism. One-size fingerprinting problematic amid evolving proprietary methods - so rightsholders remain on the sidelines.

Bitkom represents more than 2,300 companies from the digital economy. They generate an annual turnover of 200 billion euros in Germany and employ more than 2 million people. Among the members are 1,000 small and medium-sized businesses, over 700 start-ups and almost all global players. These companies provide services in software, IT, telecommunications or the internet, produce hardware and consumer electronics, work in digital media, create content, operate platforms or are in other ways affiliated with the digital economy. 82 percent of the members' headquarters are in Germany, 8 percent in the rest of the EU and 7 percent in the US. 3 percent are from other regions of the world. Bitkom promotes and drives the digital transformation of the German economy and advocates for citizens to participate in and benefit from digitalisation. At the heart of Bitkom's concerns are ensuring a strong European digital policy and a fully integrated digital single market, as well as making Germany a key driver of digital change in Europe and the world.

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Bitkom 2026

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