

Blockchain, Smart Contracts and Copyright

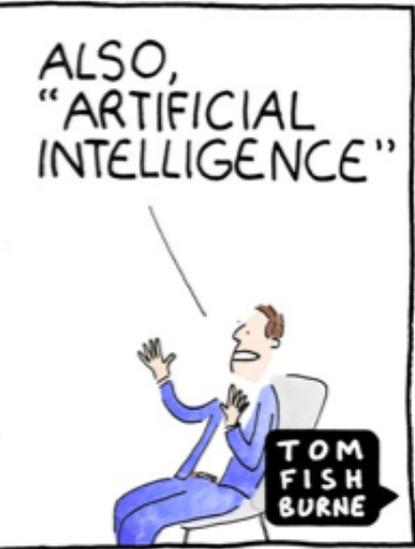
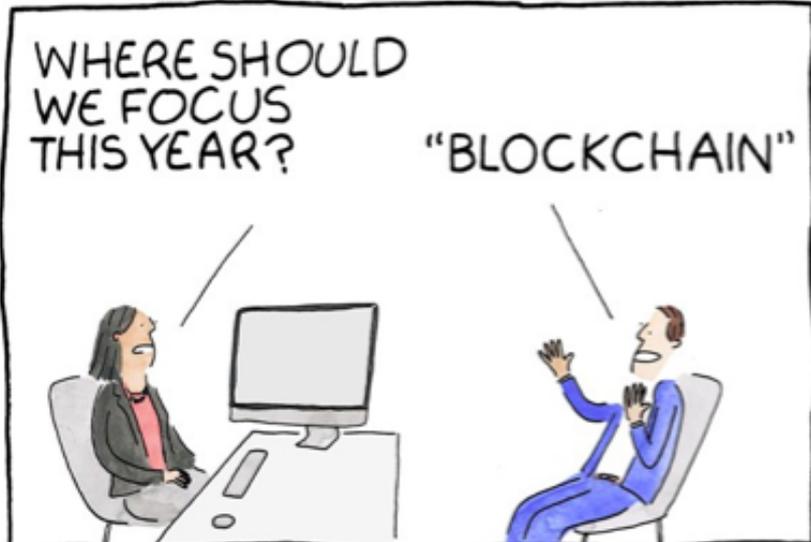
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Blockchain & Society Policy Research Lab
University of Amsterdam
@JPQuintais



7th Annual MIPLC Alumni Conference
23 February 2019 | Munich

Prologue

on the technology and themes



On terminology (1)

- **Blockchain:** ‘a data storage system using linked sequential chunks of information... a chain of blocks designed to create an immutable ledger of transactions’
- **Blockchain network / system:** ‘collection of computers running software that maintains a blockchain in a consistent state called “consensus”’
- **Distributed ledger:** general term often used for blockchains and similar consensus-based systems
- **Cryptocurrency:** (“digital” or “virtual” currency) based on cryptography rather than central-bank control of the money supply

On terminology (2)

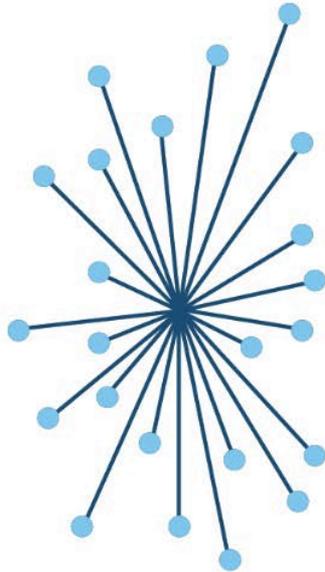
- **Public and permissionless:** blockchain network that is open and anonymous – anybody that downloads the OS software can participate (e.g. Bitcoin, Ethereum) → *no single point of failure*
- **Private and permissioned:** ledger can only be accessed if required authorization is granted, often on private networks and run on proprietary software (e.g. Ripple)
- Public – private as a *spectrum*: in between there is a range of hybrids
- But... no universal agreed upon definition of blockchain
 - Legal analysis requires framing the exact scope of the distributed ledger technology at issue

On the technology (1)

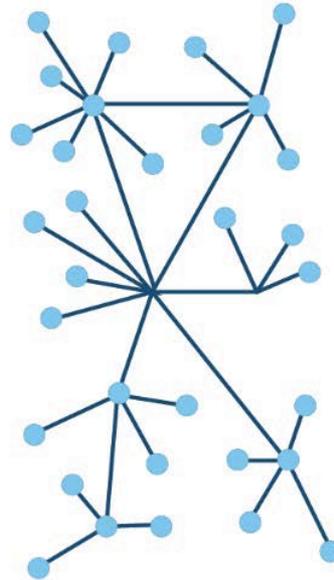
- Blockchain is not a completely new technology
- It is a combination of pre-existing technological foundations:
 - **Distributed ledgers**
 - p2p network of validation nodes that communicate on a decentralized basis
 - **Asymmetric cryptography**
 - Science of secure communications
 - **Merkle trees** (or “Hash Trees”)
 - ‘can be used to verify any kind of data stored, handled and transferred in and between computers. They can help ensure that data blocks received from other peers in a peer-to-peer network are received undamaged and unaltered, and even to check that the other peers do not lie and send fake blocks.’ (Wikipedia, *Merkle Trees*)

On the technology (2)

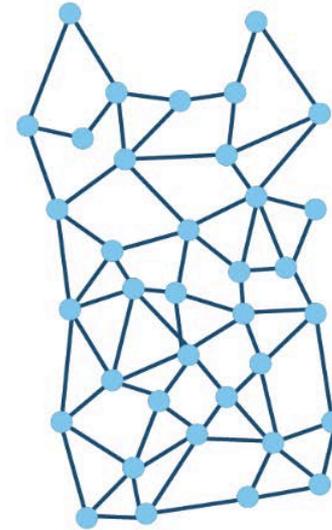
Networks



Centralized



Decentralized

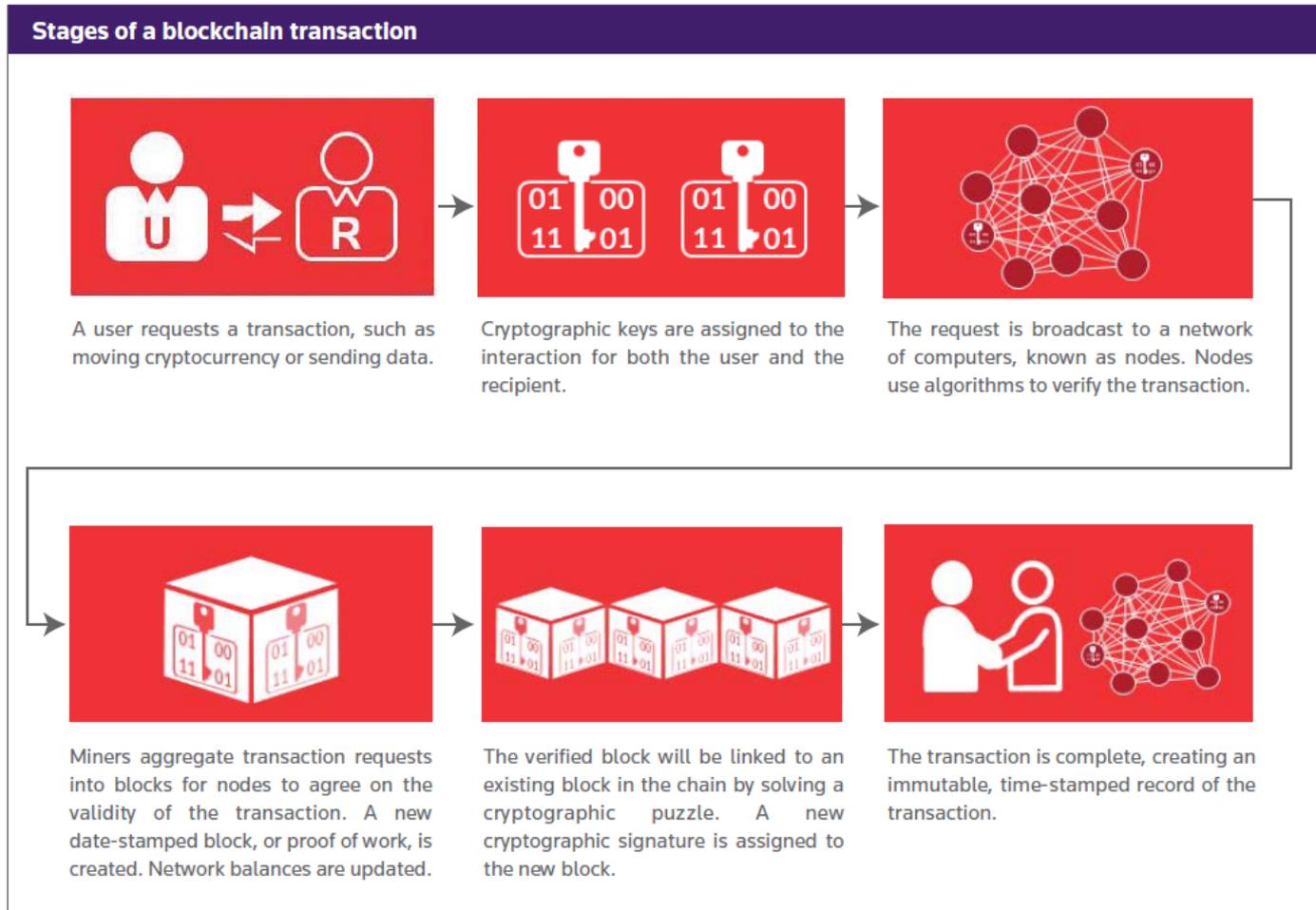


Distributed

→ Every node is independent and interconnected with each other

- A blockchain consists of connected 'nodes' (data storage points) between which information is circulated
- Together, the nodes = distributed ledger, where every participant has a simultaneous copy of the data
- Decisions on which info enters the ledger are made by 'consensus' of the nodes
- Data are stored on the ledger in a 'block' with other data in 'hash' form, arranged in specific timestamped order (the 'chain') [Hash: mathematical function that transforms content into string of letters & numbers]

On the technology (3)



Hiroshi Sheraton & Birgit Clark, *Blockchain And IP: Crystal Ball-Gazing Or Real Opportunity?* PLC Magazine (October 2017), p. 40 © PLC/Baker & McKenzie 2018 [reproduced with permission of the authors]

Mining is a 'repetitive lottery (random) process' → winner gets to validate the next block (+ a **block reward**) → Full nodes then independently check ledger for legitimacy of the block → consensus mechanism **PoW**: arbitrary cryptographic puzzle involving 'hashes' → winning the lottery requires 'massive and growing computing power' → cheating costly & difficult (...51% attack)

Recent history

- **2008:** financial crisis
- ...Publication of '**Bitcoin: A Peer-to-Peer Electronic Cash System**', by Satoshi Nakamoto (pseudonym)
 - “We have proposed a system for electronic transactions without relying on trust”
- **2015:** launch of the **Ethereum**, an open software platform based on blockchain technology that enables developers to build and deploy decentralized applications
- Ethereum allows the creation of '**smart contracts**' on their distributed network
 - 'self-executing code that automatically processes its inputs when triggered
 - small computer program that executes on each node (computer) of a blockchain network and this independently of the control of a single actor. (Finck 2019)
 - Mostly encode 'if-then' conditional statements
- Bitcoin as an *app* ant Ethereum as the *app store*



ethereum

Tremendous excitement about the
technology, including in the area of IP



Blockchain solutions for securing intellectual property assets and innovation processes

JAAK Moves Ahead with Blockchain Pilot, Joined by BMG, Global Music Rights, Warner Music, Others

PRS for Music, ASCAP and SACEM initiate joint blockchain project

ASCAP, SACEM, and PRS for Music initiate joint blockchain project to improve data accuracy for rightsholders

Press release
21 Jun 2018

Making Content Smart

At JAAK, we're building a blockchain network that will allow the music and media industries to collaborate on a global view of content ownership and rights.

Common infrastructure enables a new approach: simplifying content licensing on the web, unlocking a world of new content experiences, and revealing previously untapped opportunities for the content industries - we call it **Smart Content**.

EY and Microsoft launch blockchain solution for content rights and royalties management for media and entertainment industry

TECHNOLOGY

Blockchain Could Help Musicians Make Money Again

by Imogen Heap
JUNE 05, 2017

Spotify acquires blockchain startup Mediachain to solve music's attribution problem

EMPOWERING MUSIC

The Ujo platform uses blockchain technology to create a transparent and decentralized database of rights and rights owners, automating royalty payments using smart contracts and cryptocurrency.

[TRY THE BETA](#)

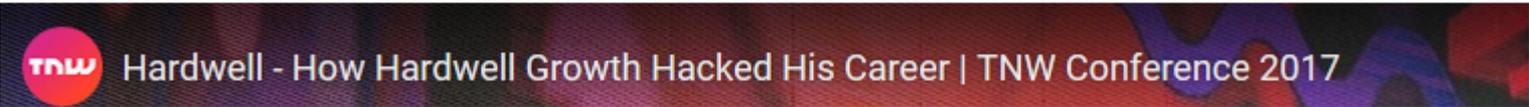
Streaming Built On Blockchain

Welcome to PeerTracks, the first streaming application utilizing the SOUNDAC Blockchain for automated royalty payments

Hardwell says he is using blockchain already and that it is going to be the future!!

youtu.be/nMlnTv...

Innovation



But also justified skepticism

Bitcoin is the greatest scam in history

It's a colossal pump-and-dump scheme, the likes of which the world has never seen.

By [Bill Harris](#) | Apr 24, 2018, 12:30pm EDT

The Economist explains

Why bitcoin uses so much energy

Its consumption is roughly the same as Ireland's



Oh dear lord, this is really a thing: "Wedding vows are supposed to be forever, putting them on the blockchain insures that they are". What better way to celebrate Valentine's Day than making your love immutable in a public ledger?

The video player shows a thumbnail with a couple in wedding attire and the text "The first 'Blockchain Marriage'". The video title is "SmartVows Blockchain Marriage Contract". The player controls show a play button, a volume icon, and a progress bar at 0:03 / 1:41. The YouTube logo and a full-screen icon are also visible.

SmartVows Blockchain Marriage Contract

SmartVows provides an easy to use Smart Contract Service for marriage c...
youtube.com



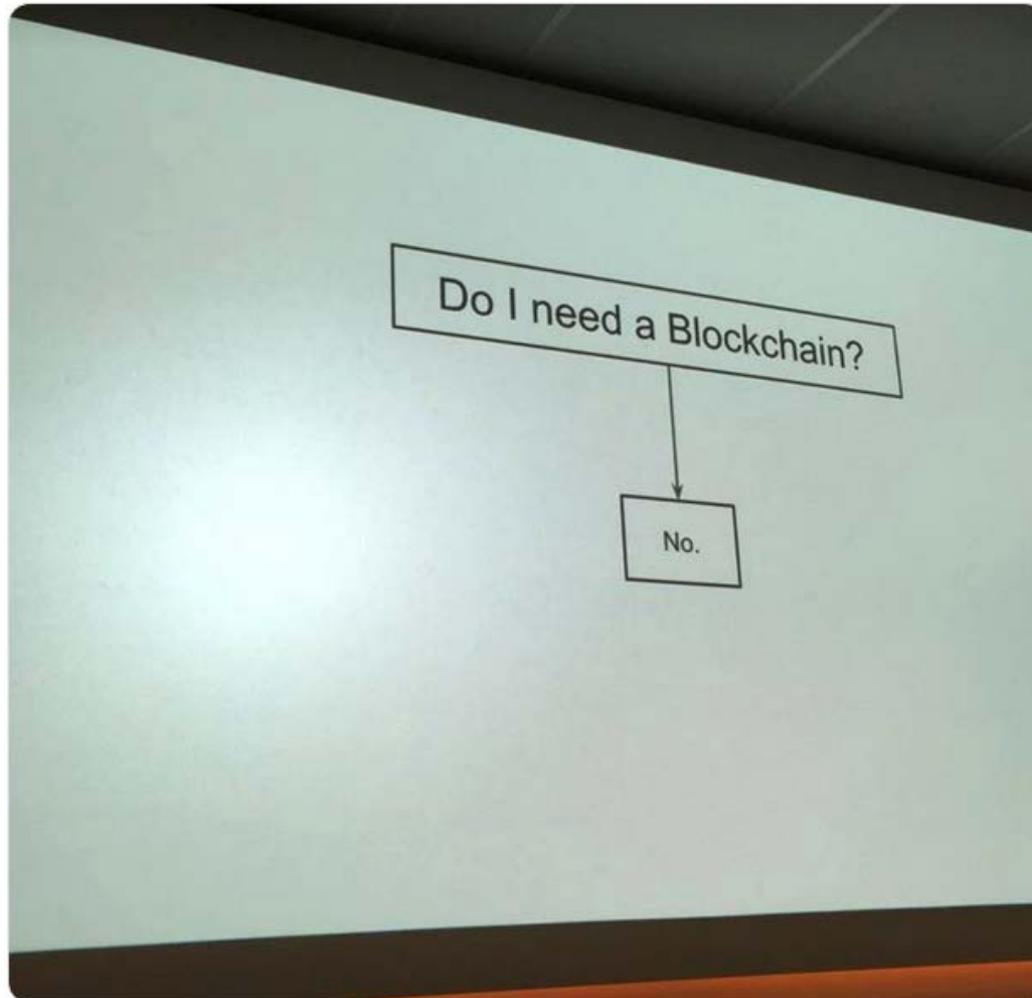
[vinton g cerf](#)

@vgcerf

Follow



Simple flowchart:



9:49 AM - 19 Jul 2018

Outline

- Research Question and Methodology
- Copyright-relevant characteristics of the technology
- Blockchain and Copyright Intersections
- Concluding Remarks: Promise vs Hype

Outline

- **Research Question**
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- Blockchain and Copyright Intersections
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Research Question(s)

- How does Blockchain technology fit with Copyright Law? Does it provide the means to retool or replace it?

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 - Promises:
 - Better, more efficient private ordering of ©
 - Fair remuneration & autonomy for creators
 - Transparent rights management
 - Disintermediation
 - Doubts:
 - Legal-technical & conceptual: is the fit that good?
 - Practical: use-cases?
 - Normative: blockchains as DRM 2.0?

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Research Questions

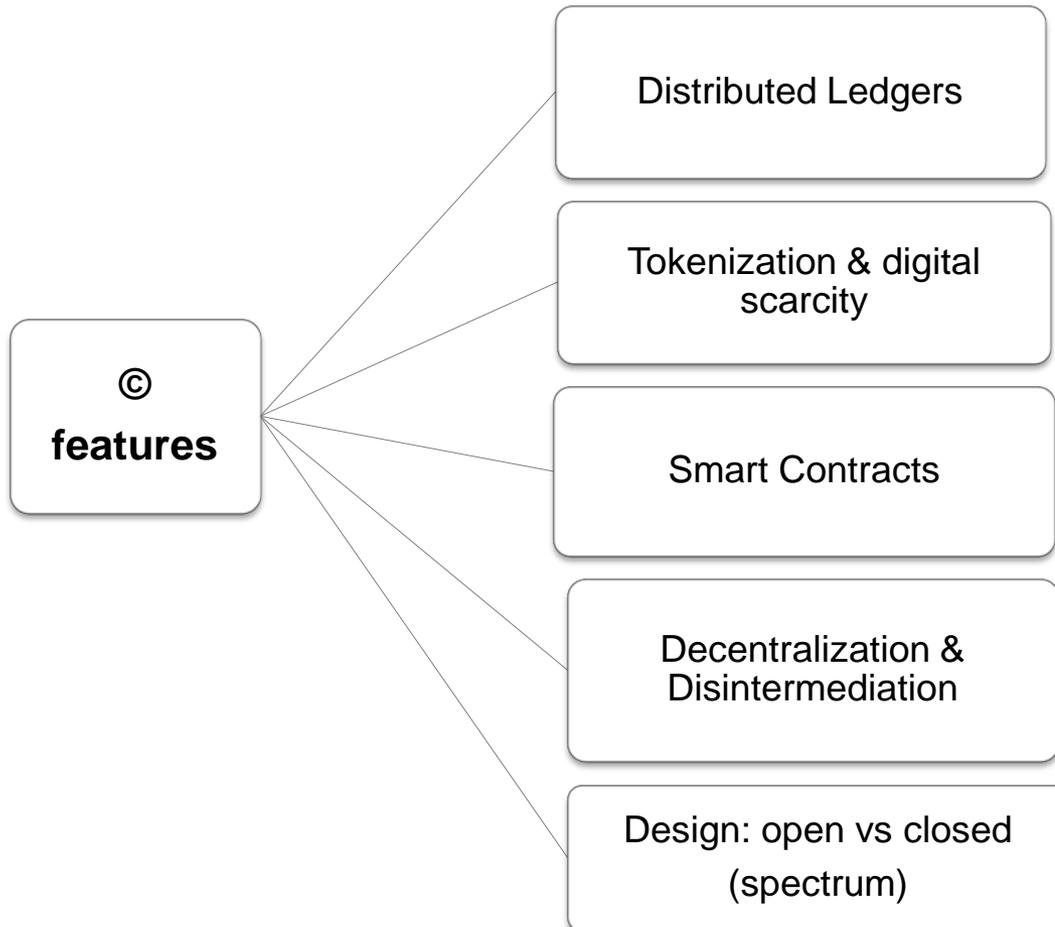
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 - Normative: blockchains as DRM 2.0?
- Issues at the core of © reform proposals

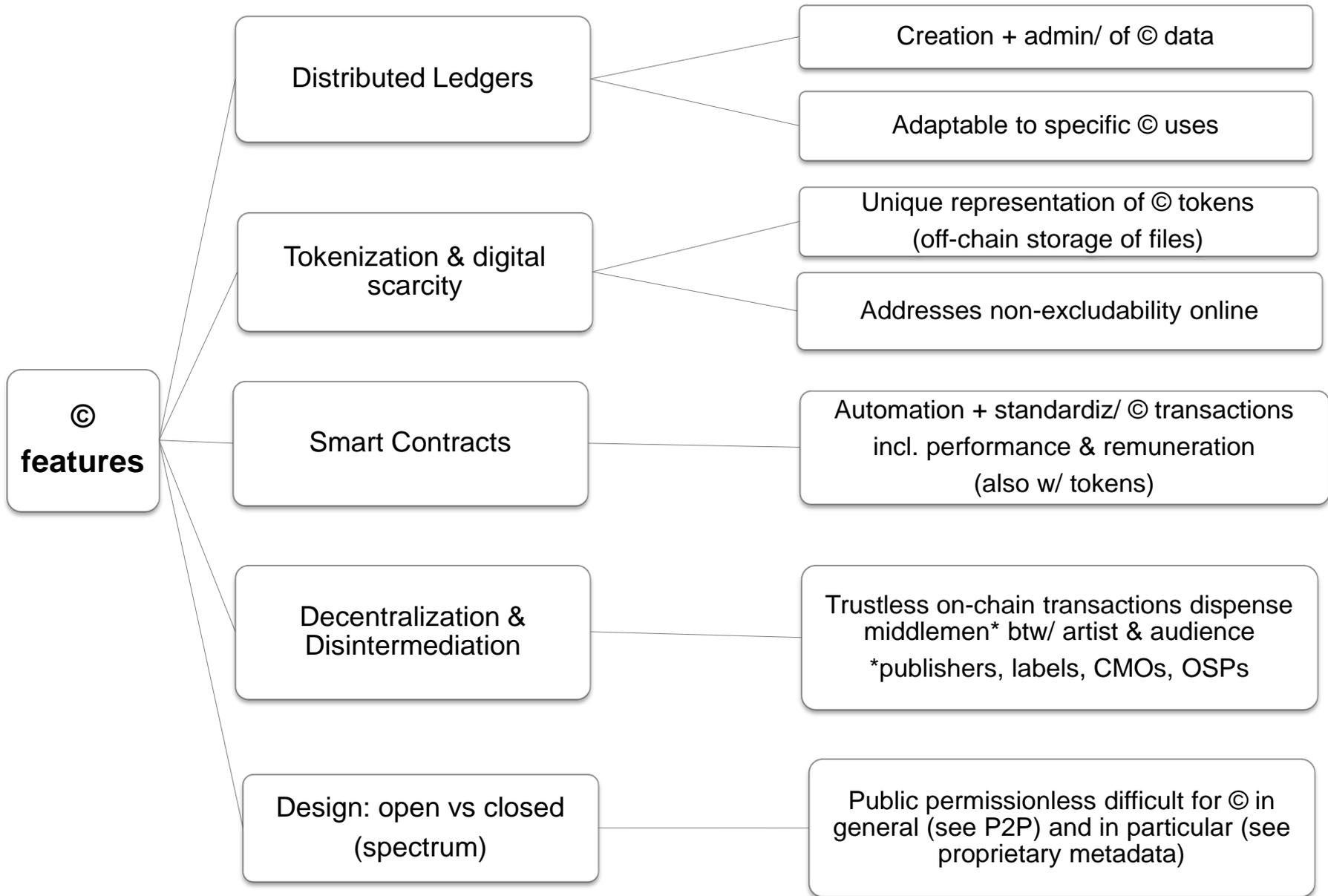
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- **Copyright-relevant characteristics of the technology**
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Copyright-relevant characteristics of the technology

- Departure point: blockchain as general-purpose technology

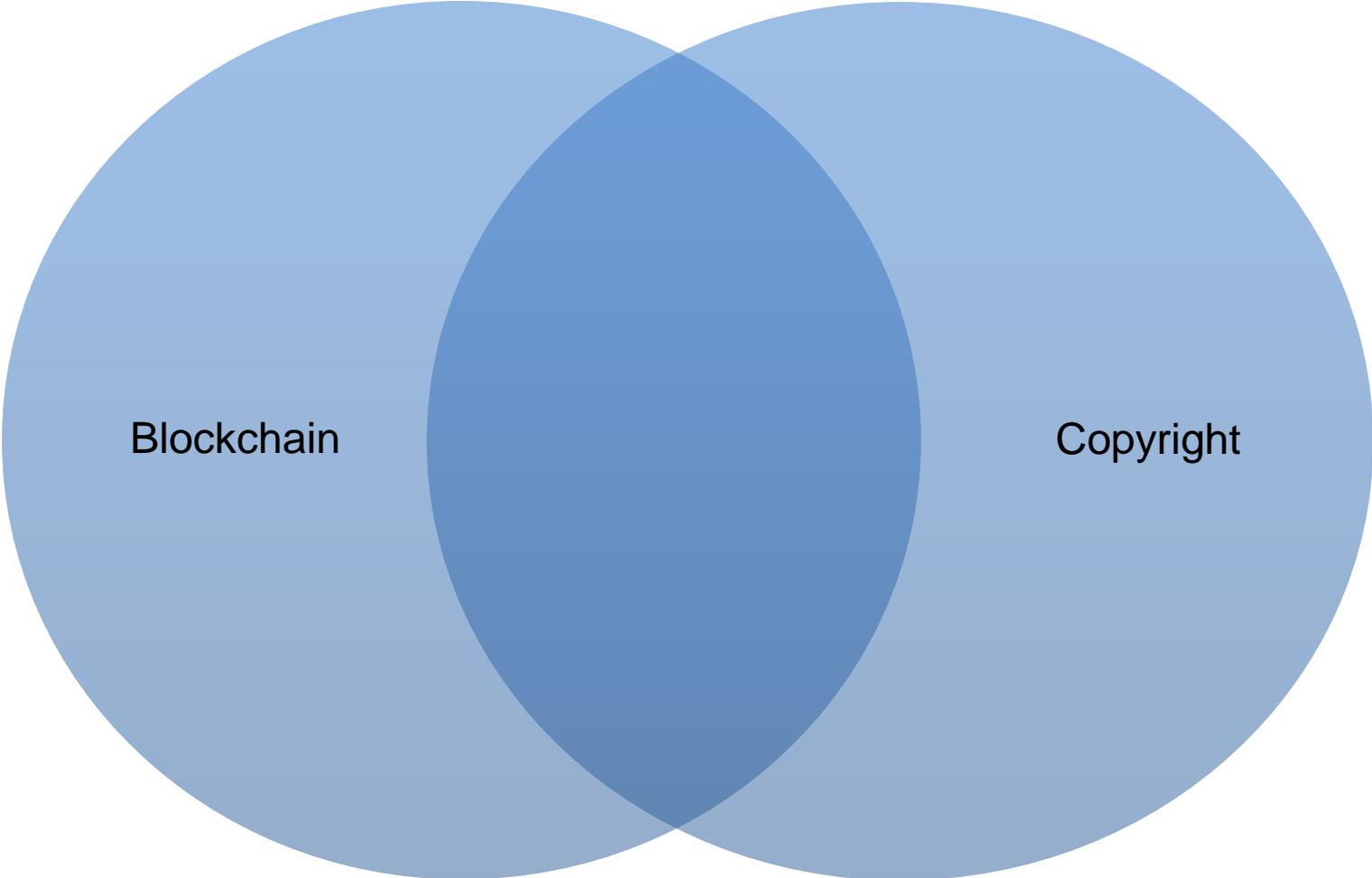




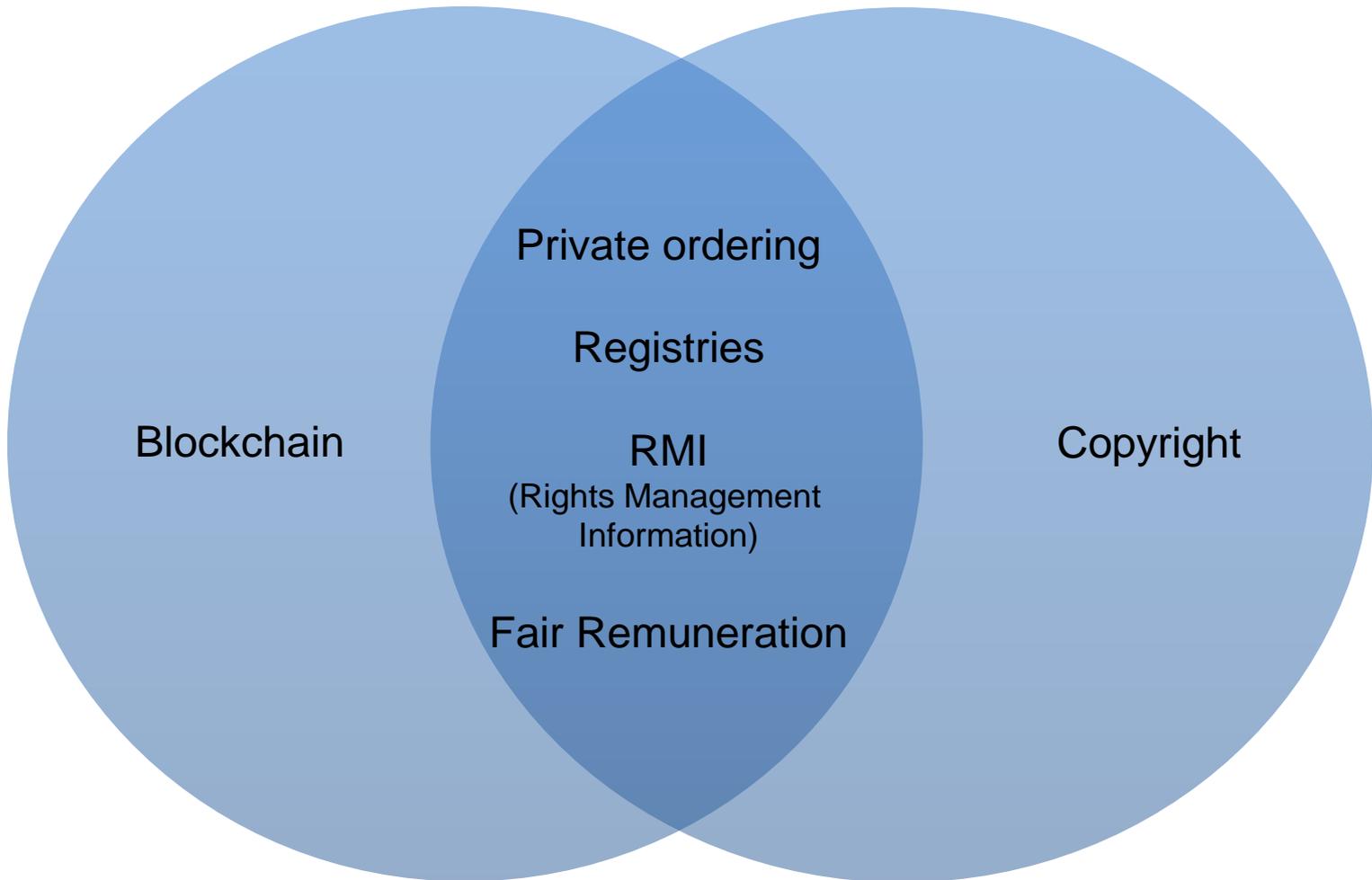
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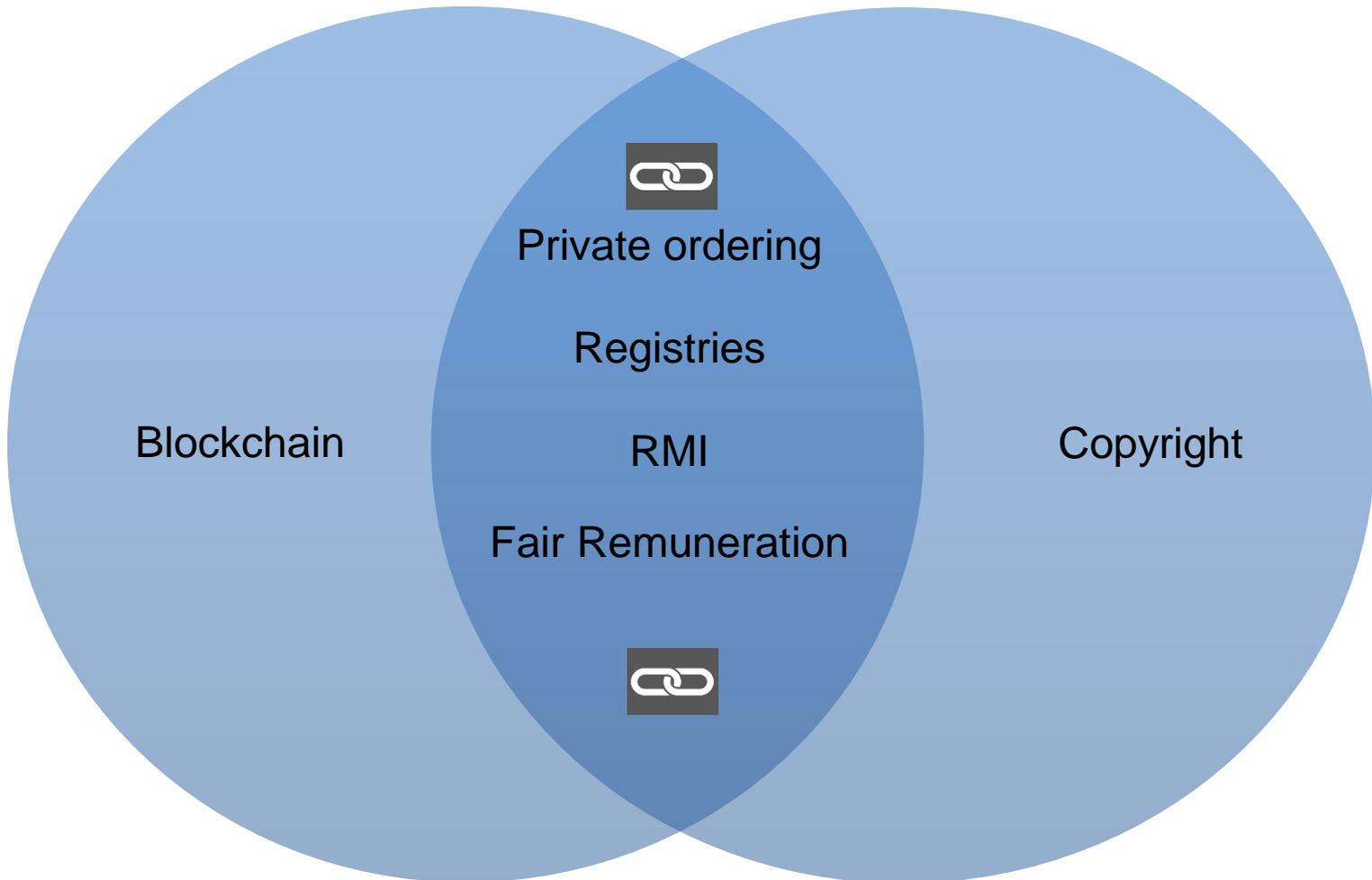
Blockchain and Copyright Intersections



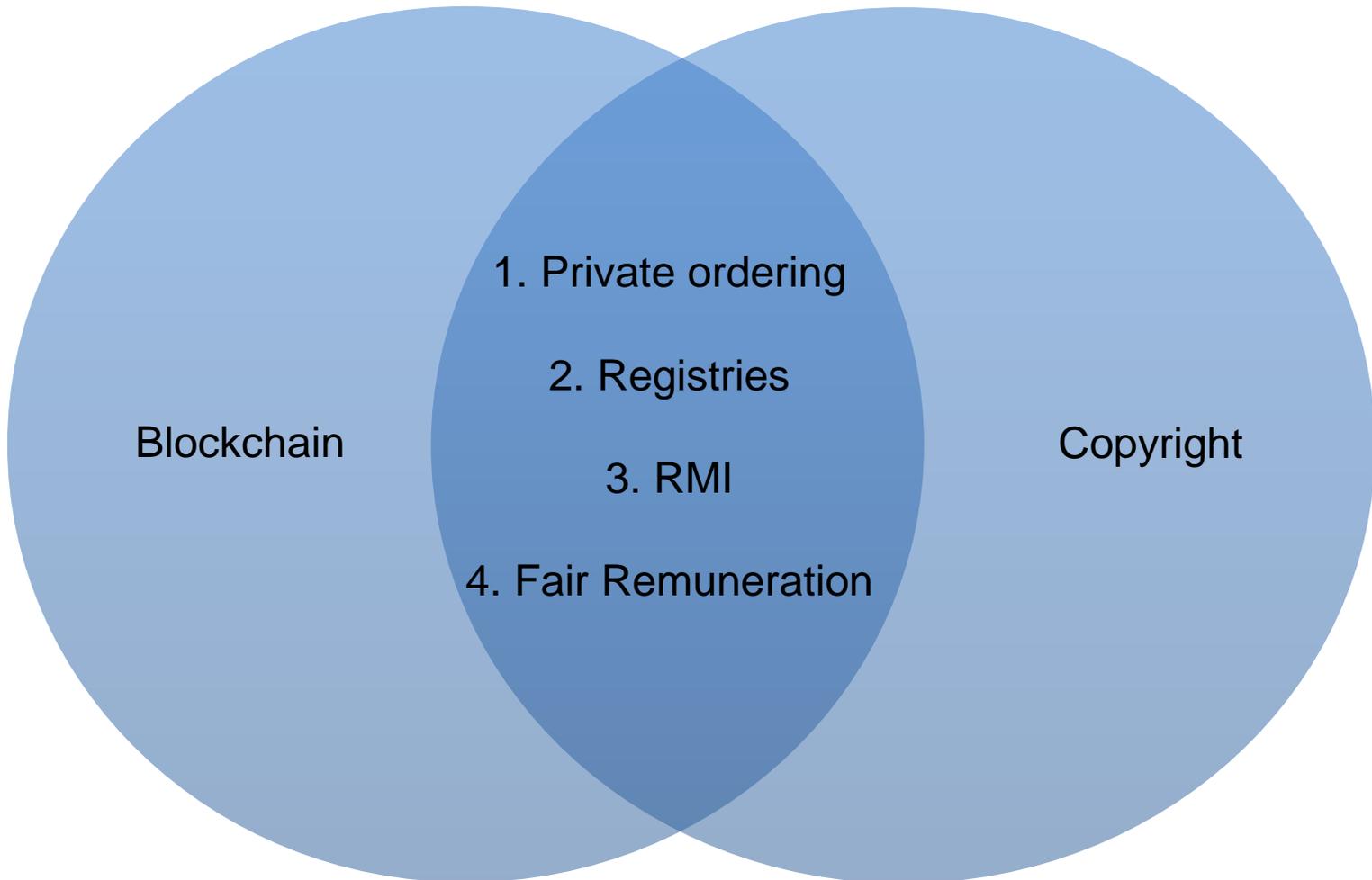
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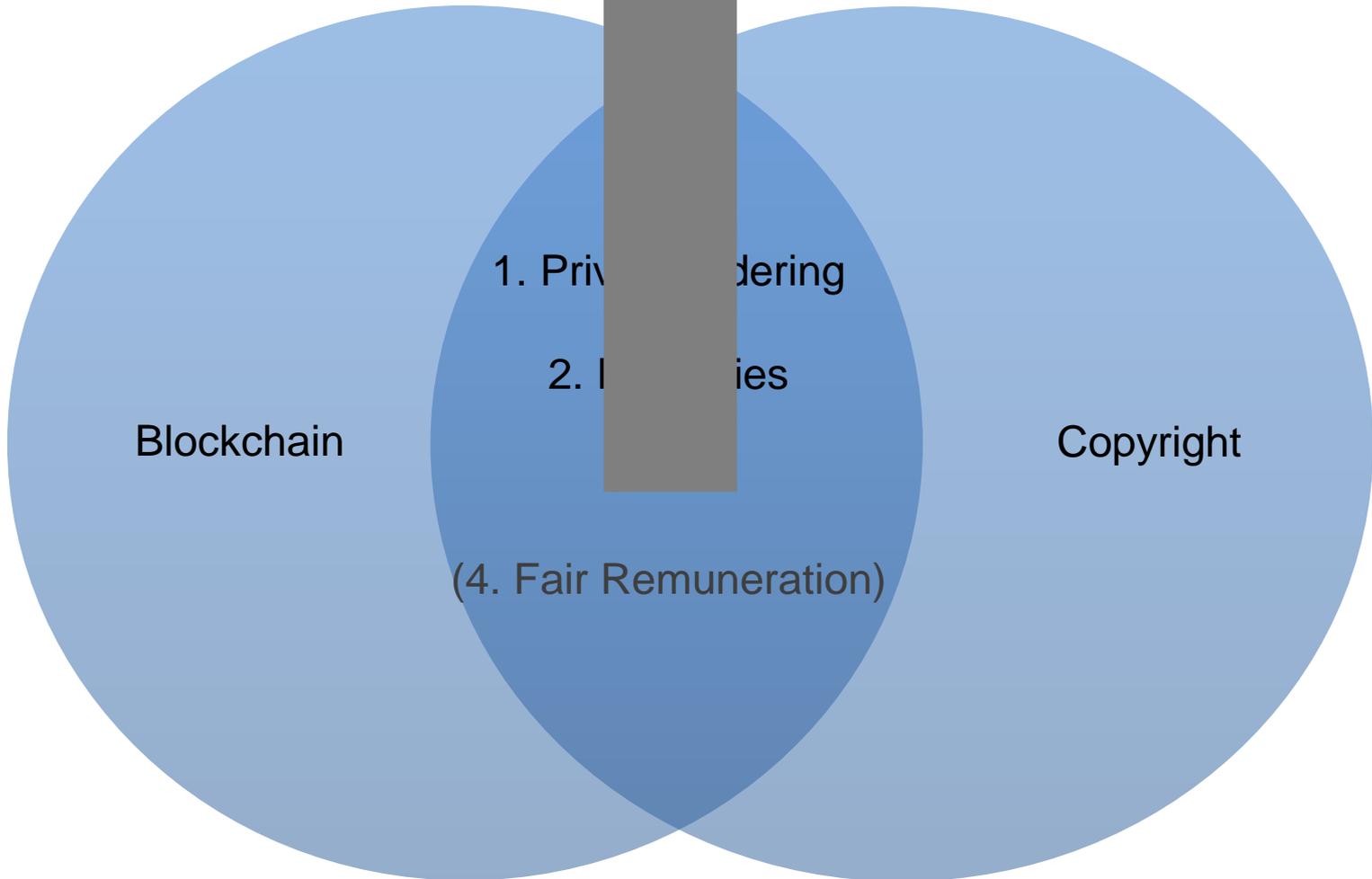
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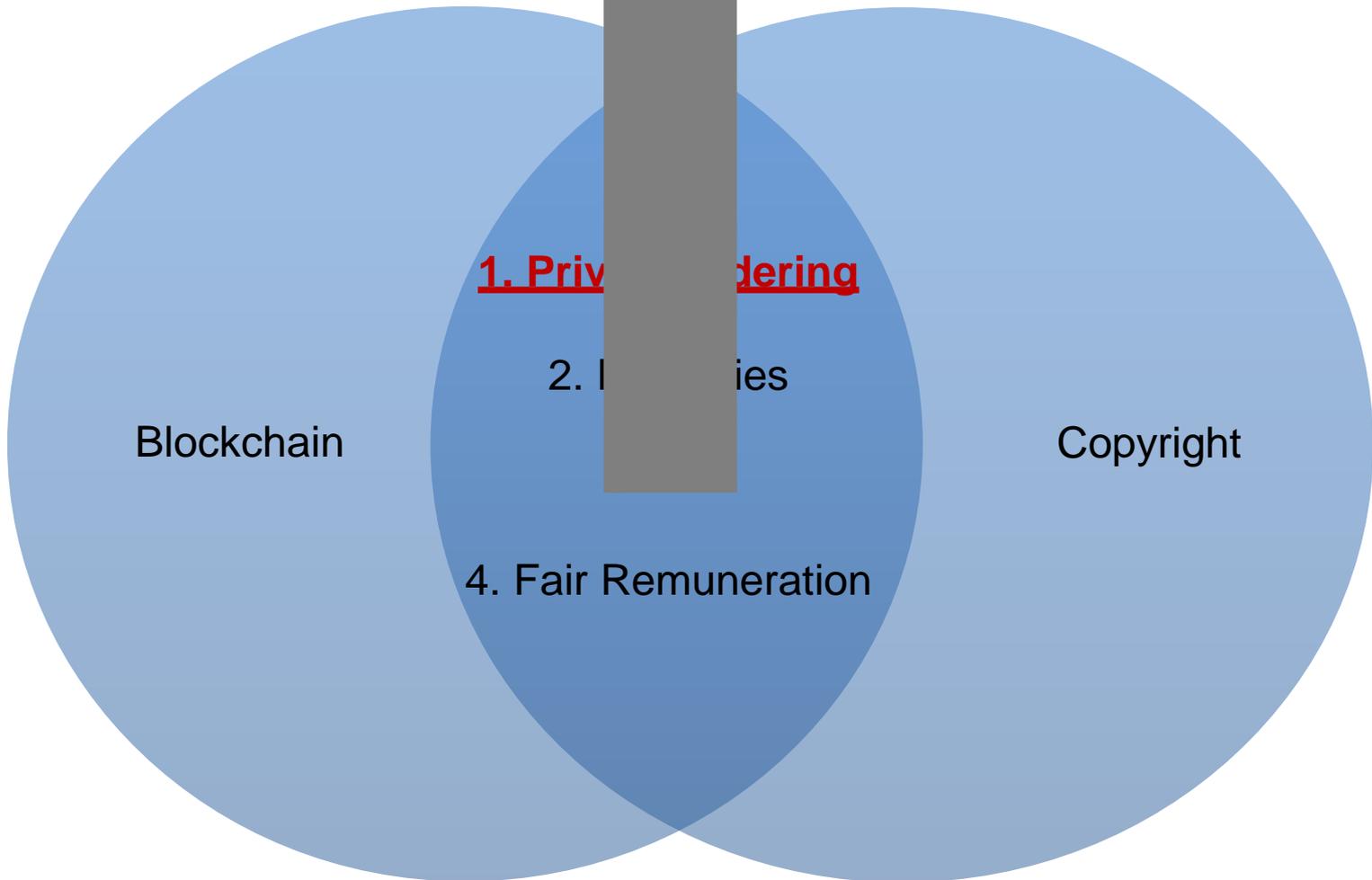
Blockchain and Copyright Intersections



Blockchain and Copyright Intersections



Blockchain and Copyright Intersections



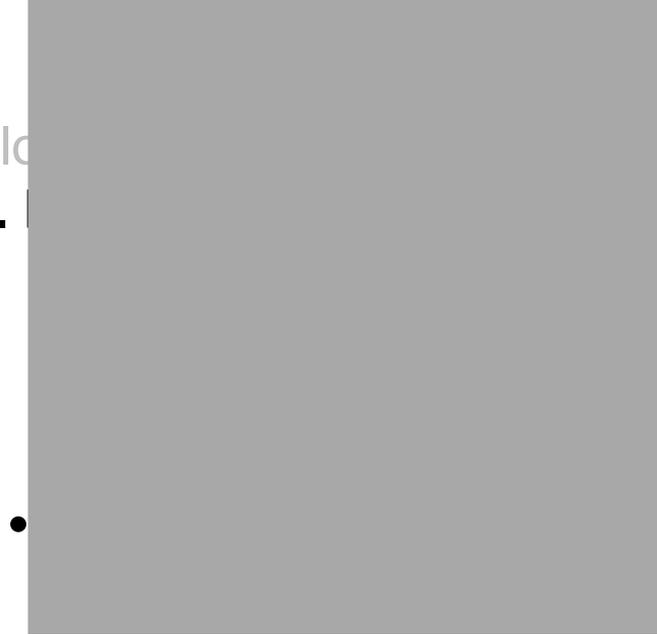
Blockchain and Copyright Intersections

1. Private Ordering

- **a)** Fragmentation
- **b)** Licensing coordination

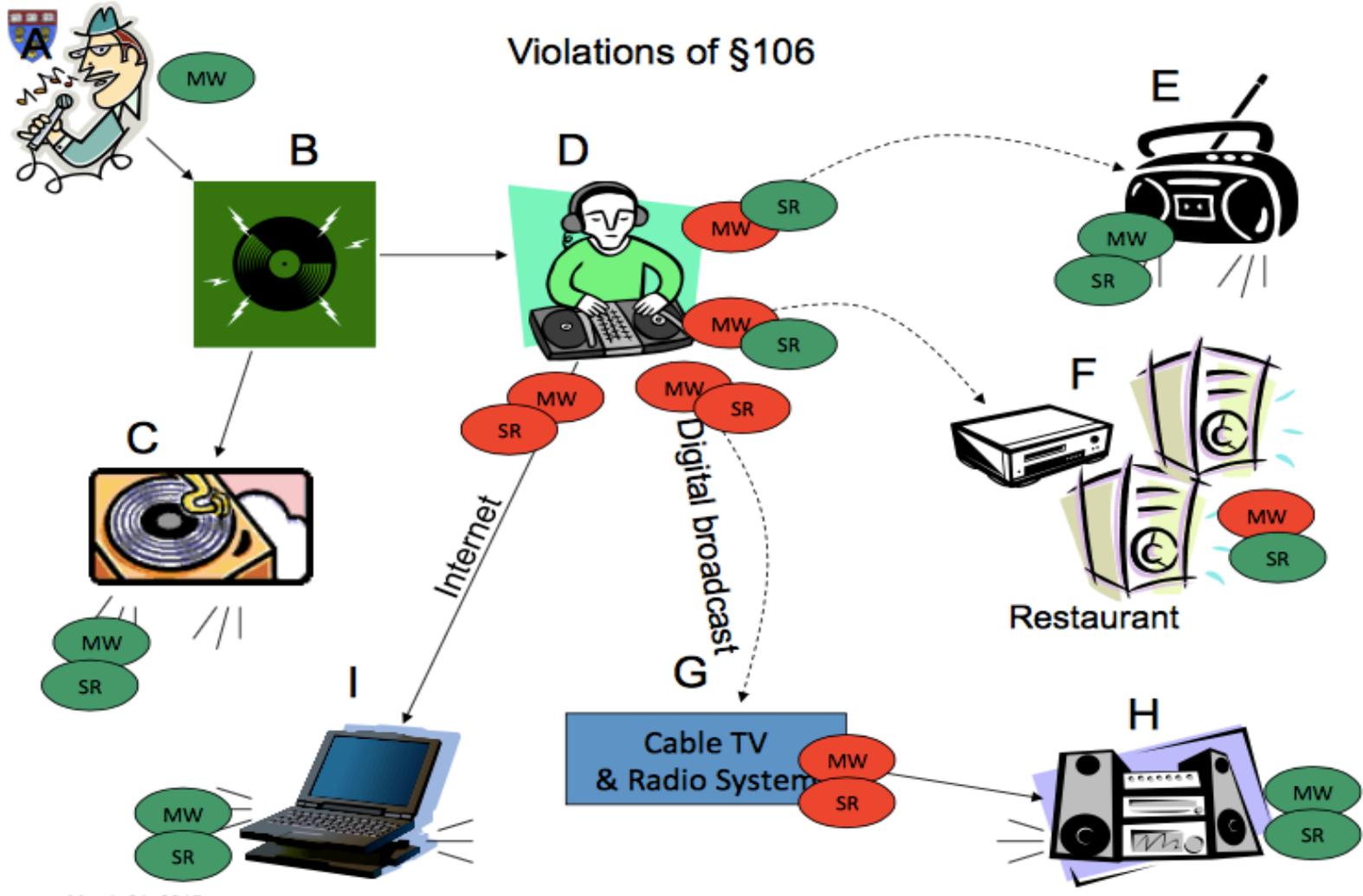
Blind Intersections

1.1



• b) Licensing coordination

a) On © fragmentation (simplified example)



a) On © fragmentation (a bit less simplified)

In the EU:
+ Performers' rights
x 28 Member States



VS

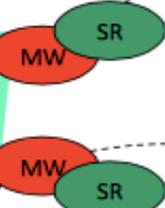


B

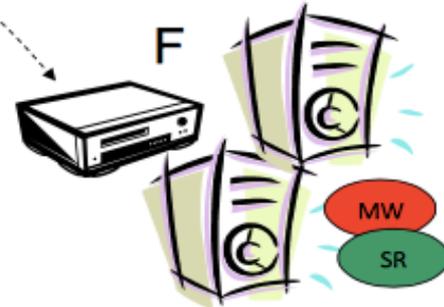


Violations of \$106

D



E



Restaurant

F

Cable TV & Radio System



H



Internet

Digital broadcast

I



BAD BLOOD FEAT KENDRICK LAMAR
Total Current ASCAP Share: 75%

Writers

ASCAP controls 37.5%

	PRO	IPI
KENDRICK LAMAR	ASCAP	670824731
MAX MARTIN	STIM	254380962
SHELLBACK	STIM	583608328
SWIFT TAYLOR	BMI	454808145

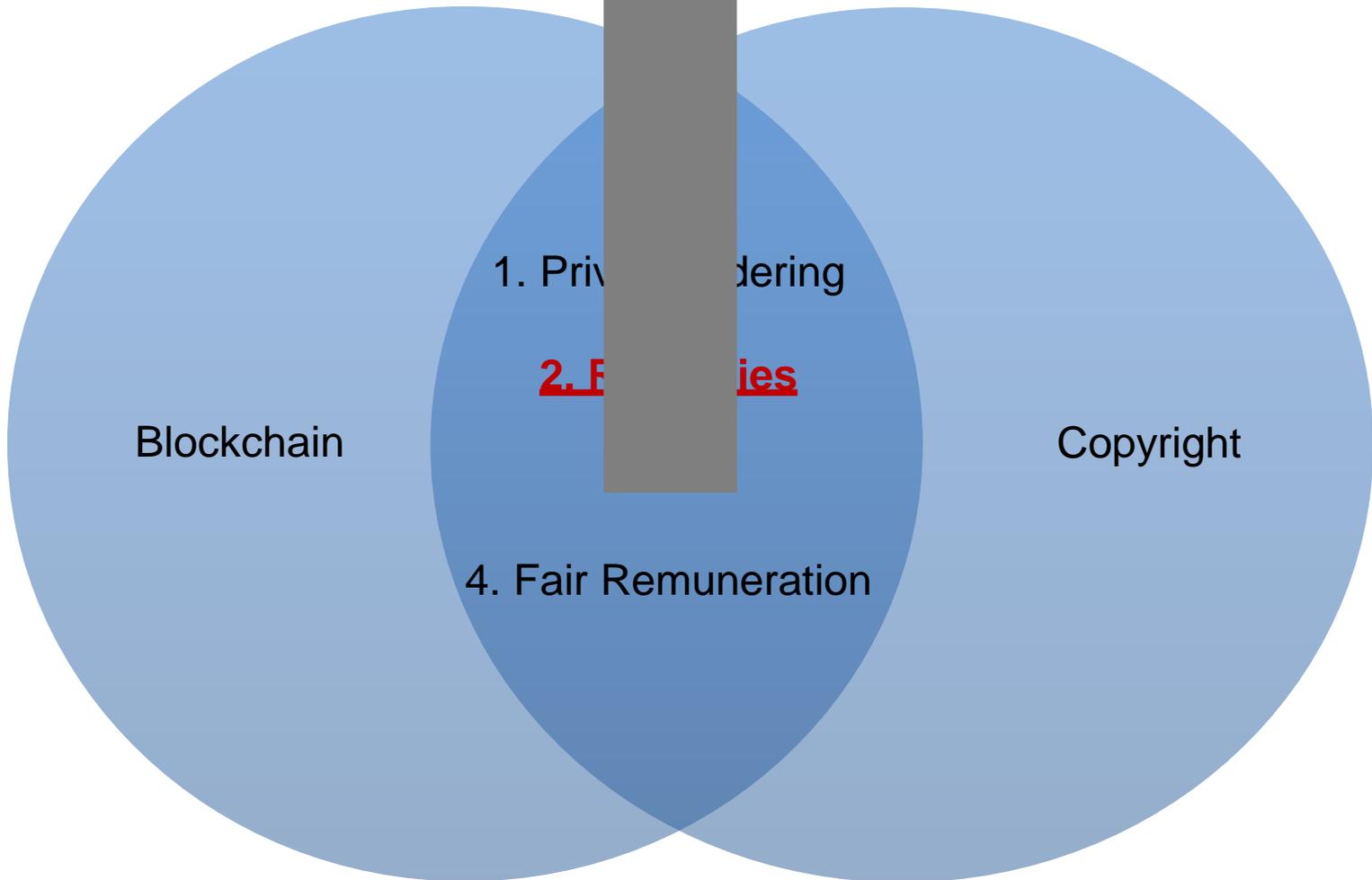
Blockchain and Copyright Intersections

1. Private Ordering

- **a) Fragmentation**

- Territorial & substantive
- In theory: 1 © “title” per territory/fragment + assignment & licensing permutations
 - NB © contract law not harmonized in the EU → diversity
- Risks
 - **Failure** of tokens & Smart Contracts to translate complexity
 - *Ex ante*: how to code for fragmentation? Non-binary or contextual terms? Subjective & factual judgments?
 - *Ex-post*: Immutability is problematic
 - » E.g. contextual E&Ls? Quality of performance?
 - **Misuse** as DRM 2.0. enforcement tool – overreach
 - **Legal effect**: Enabling de facto transactions w/out de iure effects

Blockchain and Copyright Intersections



2. Registries: formalities

- DLTs for the registration of data on © works
 - Data on initial ownership, moment of creation, RMI, terms of use, etc.
 - “Active” registries also allow © owners (as account holders) to transact rights
- Most blockchain © registries run on the Ethereum platform (e.g. Blokur, JAAK)
- Some exceptions:
 - Bernstein – Bitcoin blockchain
 - Creativechain – own blockchain (currency: CREA)

mediachain 

**Spotify acquires blockchain startup
Mediachain to solve music's attribution
problem**

**JAAK Moves Ahead with
Blockchain Pilot, Joined by
BMG, Global Music Rights,
Warner Music, Others**

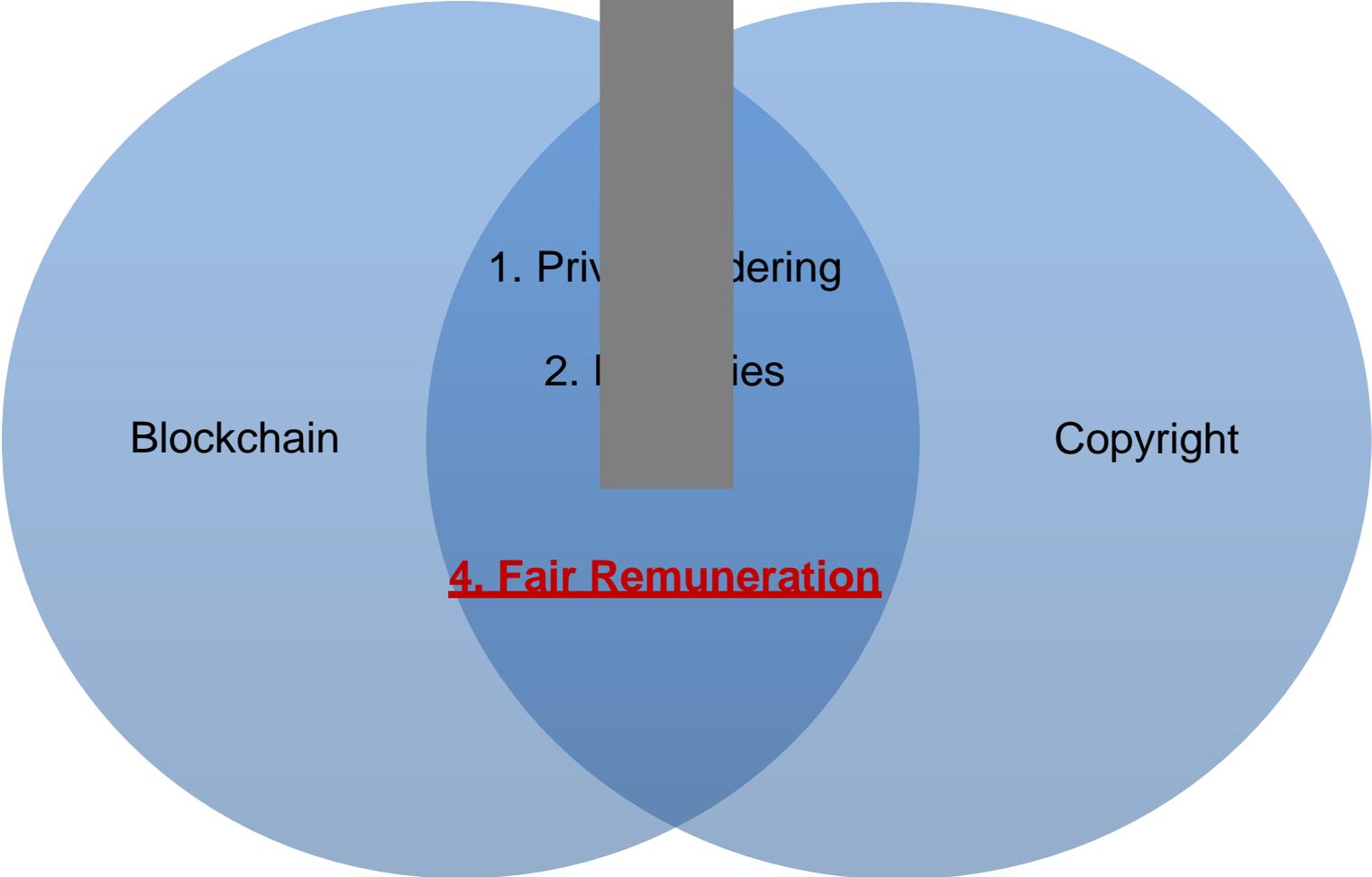
**PRS for Music, ASCAP and SACEM
initiate joint blockchain project**

ASCAP, SACEM, and PRS for Music initiate joint blockchain project to improve data accuracy for rightsholders

2. Registries: formalities

- Risks
- **a) Bad faith registrations of non-owners + immutable records** (Guadamuz)
 - Hot to correct/rectify (retroactively) ownership data & enforce court orders re: inaccurate claims?
 - Possible solution: centralization of registration authority → still blockchain?
- **b) Abundance & diversity of registries** (Janssens & Vanherpe 2018)
 - 'Renewed scattering of © repertoire'
- **c) Banned formalities?**
 - Mandatory: prohibited under art 5(2) Berne
 - Voluntary
 - E.g. CMOs DB of metadata (standard codes) for music recordings
 - Legally compliant 'new-style' formality, even if it becomes the 'de facto' norm

Blockchain and Copyright Intersections



1. Privacy

2. Licensing

4. Fair Remuneration

Blockchain and Copyright Intersections

4. Fair Remuneration

3 potential – and related – roles:

- **a)** Enable payments in competition w/ existing platforms
- **b)** Replace legal licenses for mass uses (or CMOs)
- **c)** Transparency on payments for creators

TECHNOLOGY

Blockchain Could Help Musicians Make Money Again

by Imogen Heap

JUNE 05, 2017

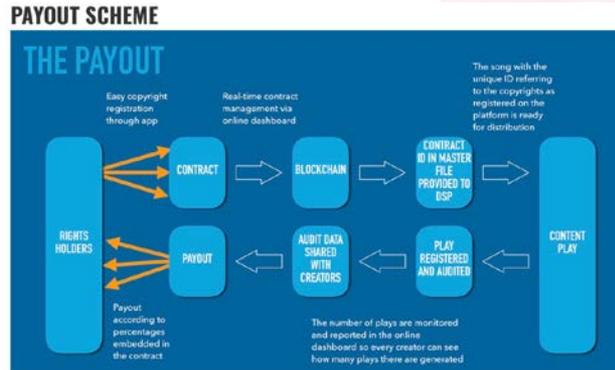
CREATIVE Passport ...|



Streaming Built On Blockchain
Welcome to PeerTracks, the first streaming application utilizing the SOUNDAC Blockchain for automated royalty payments



EY and Microsoft launch blockchain solution for content rights and royalties management for media and entertainment industry



Rightsshare.com: direct music licensing between artists & digital service providers

Blockchain and Copyright Intersections

4. Fair Remuneration

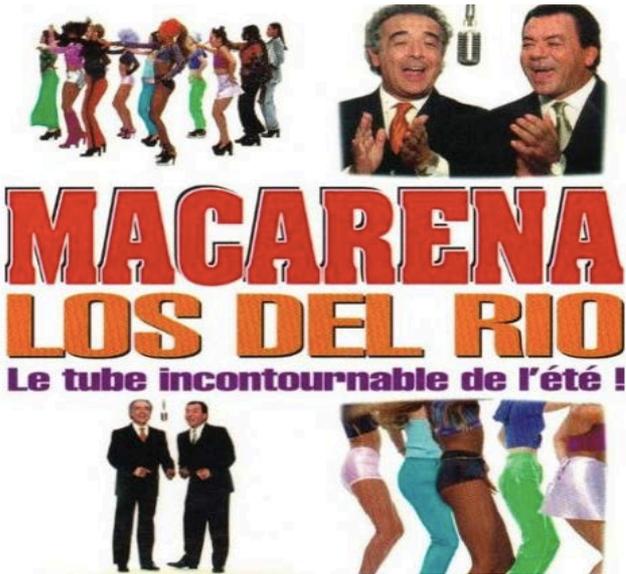
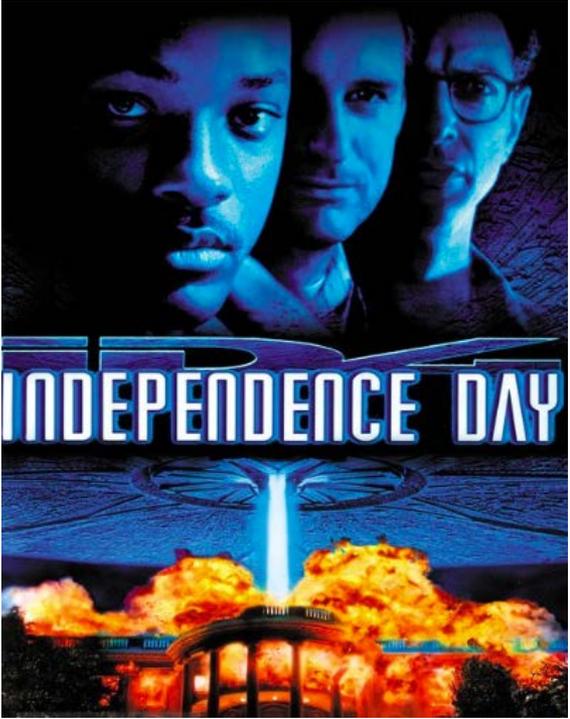
3 potential – and related – roles:

- **a) Enable payments in competition w/ existing platforms**
 - New licensing tool: registration + smart contracts + (micro) payments
 - But: new middlemen?
- **b) Replace legal licenses for mass uses (or CMOs)**
 - Standardization w/ machine-readable licenses: blanket smart contract licensing?
 - What about proprietary (legacy) metadata of CMOs & OSPs?
- **c) Transparency on payments for creators**
 - Core concern for online music and artists
 - See CRM Directive + 15—16 DSM
 - Cultural economics: transparency per se insufficient
 - Blockchain transparency as aid, not solution

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- Blockchain and Copyright Intersections
- **Concluding Remarks: Promise vs Hype**

The year was 1996



Position	Artist	Song Title
1	Los Del Rio	Macarena (Bayside Boys Mix)

[« 1995 1996 1997 »](#)



Also in 1996

WIPO Copyright Treaty (WCT) (Authentic text)

Date of Entry into Force of Text:	March 6, 2002
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Date of Text:	December 20, 1996
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Article 11: Obligations concerning Technological Measures

Article 12: Obligations concerning Rights Management Information

- Blockchains as a tool to monitor © use and combat infringement
- DRM 2.0?

Promise vs Hype

- Blockchains 2.0 will not replace © law online, but can shape its application
- Registries + automated self-executing licenses (+ payments) are promising
- Main issues:
 - Ensuring (esp. legacy) high-quality metadata for © works
 - Mapping © hyper-fragmentation onto smart contracts
 - Accounting for dynamic E&Ls ↔ smart contract overreach
 - Validity + conflict resolution of self-executing immutable smart contracts
 - End-user adoption in light of superior services (e.g. Spotify & Netflix)
- Conceptual alignment ©/blockchain but legal-technical incompatibilities
- To overcome them, the technology must reach much higher level of development, scalability, reliability & market adoption...
- Hybrid agreements and public-private blockchains as the future?

Thank you

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Article

OXFORD

Blockchain and smart contracts: the missing link in copyright licensing?

Balázs Bodó*, Daniel Gervais[†] and João Pedro Quintais[‡]

Blockchain and the Law: A Critical Evaluation

by João Pedro Quintais, Postdoctoral Researcher at the University of Amsterdam, Institute for Information Law, Balázs Bodó, Senior Researcher at the University of Amsterdam, Institute for Information Law, Alexandra Giannopoulou, Postdoctoral Researcher at the University of Amsterdam, Institute for Information Law, and Valeria Ferrari, PhD Candidate at the University of Amsterdam, Institute for Information Law

