Building a Media Registry with Git and Sawtooth

HYPERLEDGER MEMBER SUMMIT 2019 – TOKYO, JAPAN

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Founding Director
Cardstack Project
Media Registry
CONTAINS ALL OF THE FOLLOWING ELEMENTS

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Property</th>
<th>Product</th>
<th>Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Ownership</td>
<td>Asset</td>
<td>Standards</td>
</tr>
<tr>
<td>Name</td>
<td>License</td>
<td></td>
<td></td>
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Music Registry

Contains all of the following elements

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Music Registry
SPLIT INTO TWO HALVES

“Track you listen to on Spotify”

Recording
- Identifier
- Ownership
- Name
- Taxonomy
- Product
- Asset

Composition
- Identifier
- Ownership
- Name
- Company
- Property
- License

“Tune you sing in the shower”

MISSING LINKS?
Record Label
3rd largest (~18% Market Share)

MISSING LINKS?

Warner Music Group

Music Publisher
3rd largest (~12% Market Share)

Warner Chappell Music
Dot Blockchain Music Registry

Phase 1 completed in Q2 2019. Phase 2 through 1H 2020.
Cardstack Registry Architecture

**Schema (JSON)**

- master-recording
- artist
- master-owner
- copyright
- genre
- release
- release-artwork
- region
- etc.

- song
- work-detail
- writer
- works-owner
- copyright
- works-right
- region
- etc.

- SEARCHABLE DATABASE
- VERSIONED REPOSITORY
- AMENDMENT LEDGER

**Anchor**

**Index**
Cardstack Registry Architecture

Schema (JSON)

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SEARCHABLE DATABASE

Index

Git Repo

AMENDMENT LEDGER

Anchor
Combining Git & Blockchain

- Large amount of metadata and content
- Little bit of permission control logic

Reference
Packfile
Amendment Ledger
Object Storage

Git Repo
Content / Data / Code

PUSH
COPY
SYNC
Git Repo
Orchestrating the Full User Experience

- **Layer 3**: Enterprise / User Hubs
  - Card UI
  - Cardstack

- **Layer 2**: Metadata & Media Sync
  - Git Repo
  - Git

- **Layer 1**: Object Storage
  - Packfile
  - Amazon S3

- **Layer 1**: Amendment Ledger
  - Reference
  - Hyperledger Sawtooth
DOTBC APP

Schema-driven metadata entry and approval tool

- 50,000+ Entries
- 26 GB of Audio
- < 500 On-Chain Transactions

Built on CARDSTACK
Bundling Git Commits from Registry UI

Re-orient the UI around workflow steps
UPCOMING

CARD FLOW

Multi-party conversational workflow experience

Built on CARDSTACK
Thread with Bryan, Maria & Tom
Created Apr 15, 1:30 PM

Survey for Never-Ending Cup Launch Party
Event Planning Form

0 / 5 Questions completed
1. Naughty or Nice?
2. Orderly or Spontaneous?
3. Classy or Casual
4. Drinking or Dancing?

Fill Out Survey

Launch Party Planning
Survey for Never-Ending Cup

Review Itinerary
Trip to Spain
Proposed Itinerary

Recent
Negotiations with Vendors
Darryl Collier
Apr 21, 3:30 PM
Let me know if you've had a chance to review my...

Packaging Mock-Ups
Jackie West
Apr 20, 9:15 AM
Let me know if you've had a chance to review my...

Filter Unread Messages
Search Queue
Needs Response
Dismiss all
Prioritized
Latest

Go to message

Remove
Multi-party conversational workflow experience

UPCOMING

CARD FLOW

Multi-party conversational workflow experience

Built on CARDSTACK
github.com/cardstack/cardstack

- 100% Open-sourced (MIT)
- Blockchain / Cloud Agnostic
- Multiple networks on same node

PLUG-INS (30+)

NodeJS, Postgres, Git, GitHub, Docker, Hyperledger, Ethereum, Elasticsearch
Standards

CARDSTACK

Queuing
Threading
Authorization
Metering
Indexing
Persistence
Versioning
Automation
Authentication
Notification
Signature
• How would a user interact with multiple registries in a cohesive way?
  My identity, my creations, my properties, my rights, my memberships, my rewards, etc.

• Can a schema-driven model generate on-chain data structure and logic too?
  Code generation, deployment, versioning, migration & translation

• Solving the unique challenges of user experience of blockchain-based networks
  Editing vs. amendment, multi-party workflows (approve/deny), transparent per-user transaction signing
Thank you!

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