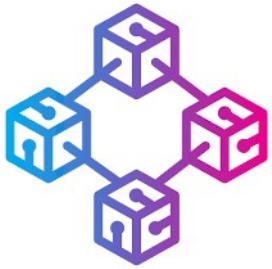
<Meta>
Maggot
Metadata aggregation on data storage

&

bloxberg



Data Management Plan (DMP)

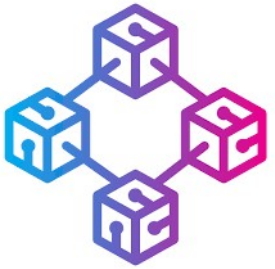
Intellectual property rights

Who will be the owner of the data produced?

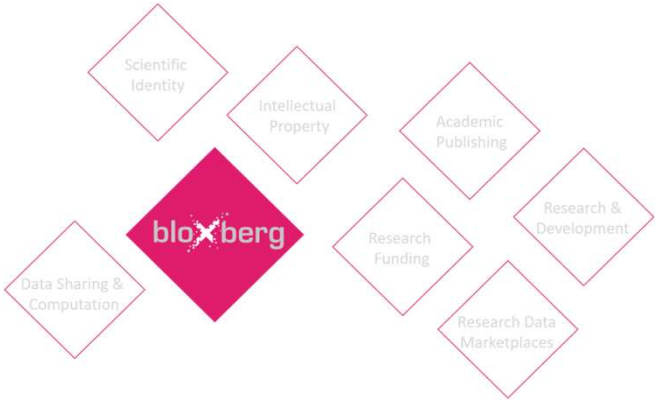
How to guarantee property rights?

How will data be used?

Implementation / Concrete actions ⇒ bloxberg



bloxberg is the blockchain from science for science



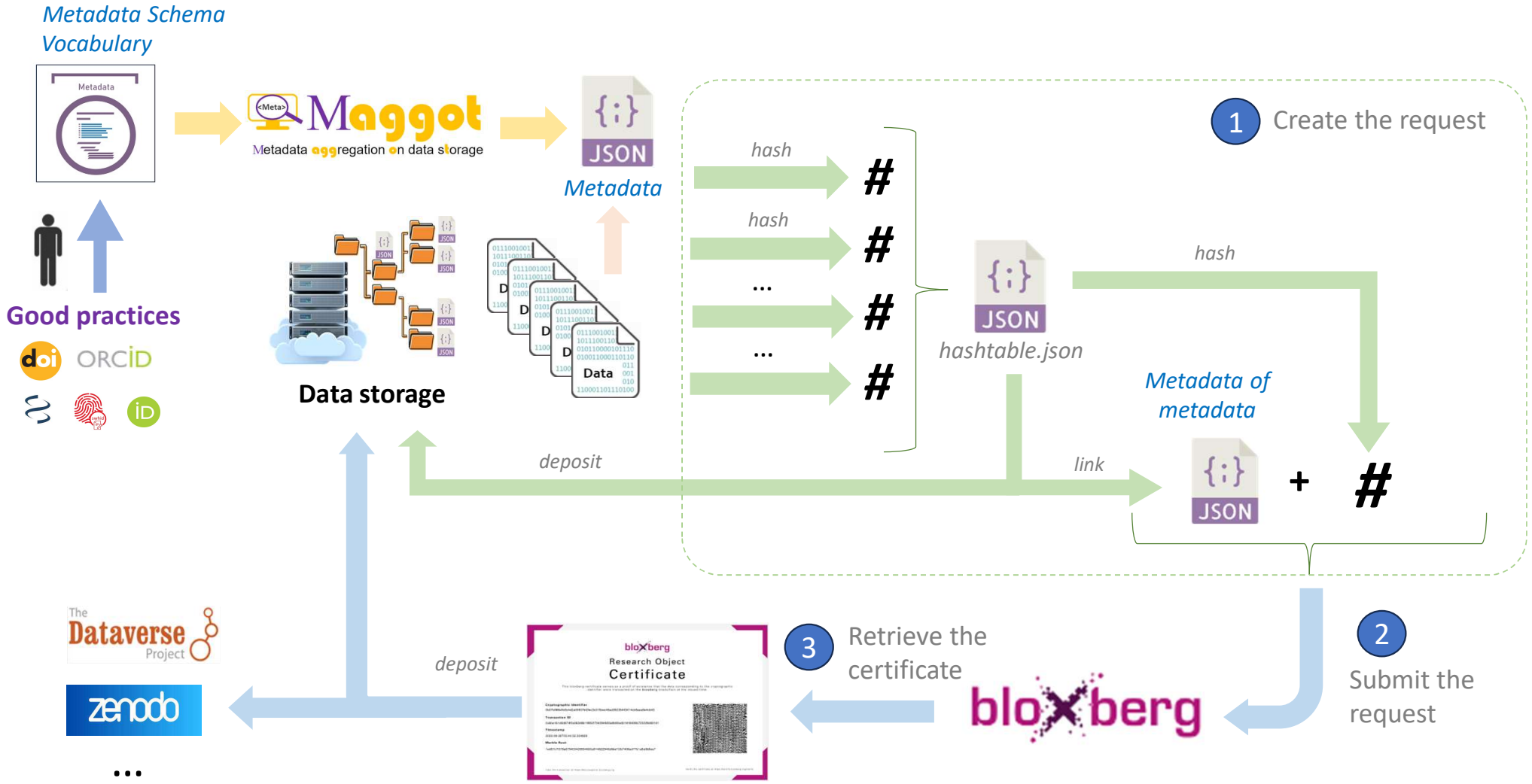
This **protects your intellectual property** and **safeguards against potential future scooping** by generating **a unique identifier from your data that is then stored on the chain**. A **certificate** is then created to **provide proof** that this information belongs to you or your organization.

Research stakeholders are then **more open to the dissemination of their data** (files, results, protocols, publications, etc.) **since** they know that, in particular, the **ownership**, **content** and **conditions of use of the data cannot not be altered.**

- The bloxberg Association consists of research institutions who run nodes.
- Each research organization will be restricted to running one authority node on the network.

49 nodes (November 2023)

Certification of metadata file on the bloxberg blockchain



Certification of metadata file on the bloxberg blockchain

EXPERIMENTAL - bloxberg Blockchain

Metadata Schema Vocabulary

Metadata

Maggot
Metadata aggregation on data storage

JSON
Metadata

deposit

Data storage

Good practices

doi ORCID

hash

1 Create the request

link

Metadata of metadata JSON + #

2 Submit the request

bloxberg

3 Retrieve the certificate

bloxberg
Research Object
Certificate

EXPERIMENTAL - bloxberg Blockchain

Certification of metadata file on the bloxberg blockchain

Internal JSON | External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:
https://certify.bloxberg.org/

Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

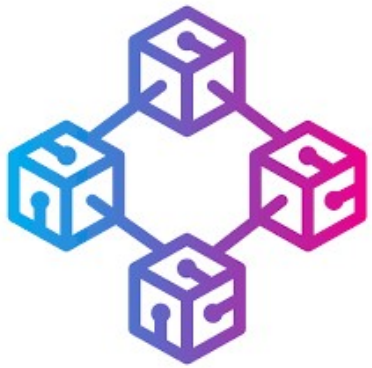
API bloxberg:
[redacted]

Publish

bloxberg

Certification

Certify your Research Data on the blockchain.



To deposit in a blockchain, you must be authorized to do so so that the certificates are attached to a recognized entity (i.e. Authority)

EXPERIMENTAL - bloxberg Blockchain

Certification of metadata file on the bloxberg blockchain

Internal JSON | External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:
https://certify.bloxberg.org/

Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:
[redacted]

Publish

1 Create the request

- Metadata file — META_frim1.json
- bloxberg metadata — bloxberg_metadata_frim1.json
- bloxberg query — bloxberg_query_frim1.json

Metadata File


```
{
  "profile": "https://pmb-bordeaux.fr/maggot/conf/maggot-schema.json",
  "title": "frim1",
  "fulltitle": "FRIM - Fruit Integrative Modelling",
  "license": "Etalab V2.0 license",
  "depositor": "Jacob Daniel",
  "publication_idnumber": "10.1104/pp.113.231241",
  "publication_url": "https://doi.org/10.1104/pp.113.231241",
  "description": "The project aimed to build a virtual tomato fruit that enables the prediction of metabolite levels given genetic and environmental inputs, by an iterative process between laboratories which combine expertise in fruit biology, ecophysiology, theoretical and experimental biochemistry, and biotechnology.",
  "publication_citation": "Biais B, Bénard C, Beauvoit B, Colombié S, Prodhomme D, Ménard G, Bernillon S, Gehl B, Gautier H, Ballias P, Mazat J-P, Sweetlove L, Génard M, Gibon Y. 2014. Remarkable reproducibility of enzyme activity profiles in tomato fruits grown under contrasting environments provides a roadmap for studies of fruit metabolism. Plant Physiology 164, 1204-1221",
  "status": "Processed",
  "access_rights": "Public",
  "publication_idtype": "doi",
  "contacts": [
    "Gibon Yves"
  ],
  "authors": [
    "Bénard Camille",
    "Biais Benoit",
    "Beauvoit Bertrand",
    "Colombié Sophie"
  ],
  "collectors": [
    "Bénard Camille",
    "Biais Benoit",
    "Ballias Patricia",
    "Maucourt Mickaël"
  ],
  "curators": [
    "Moing Annick",
    "Jacob Daniel"
  ],
  "leader": [
    "Gibon Yves"
  ],
  "wpleader": [
    "Vercambre Gilles"
  ],
  "producer": [
    "Bordeaux Metabolome"
```

EXPERIMENTAL - bloxberg Blockchain

Certification of metadata file on the bloxberg blockchain

Internal JSON | External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:
https://certify.bloxberg.org/

Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:
[redacted]

Publish

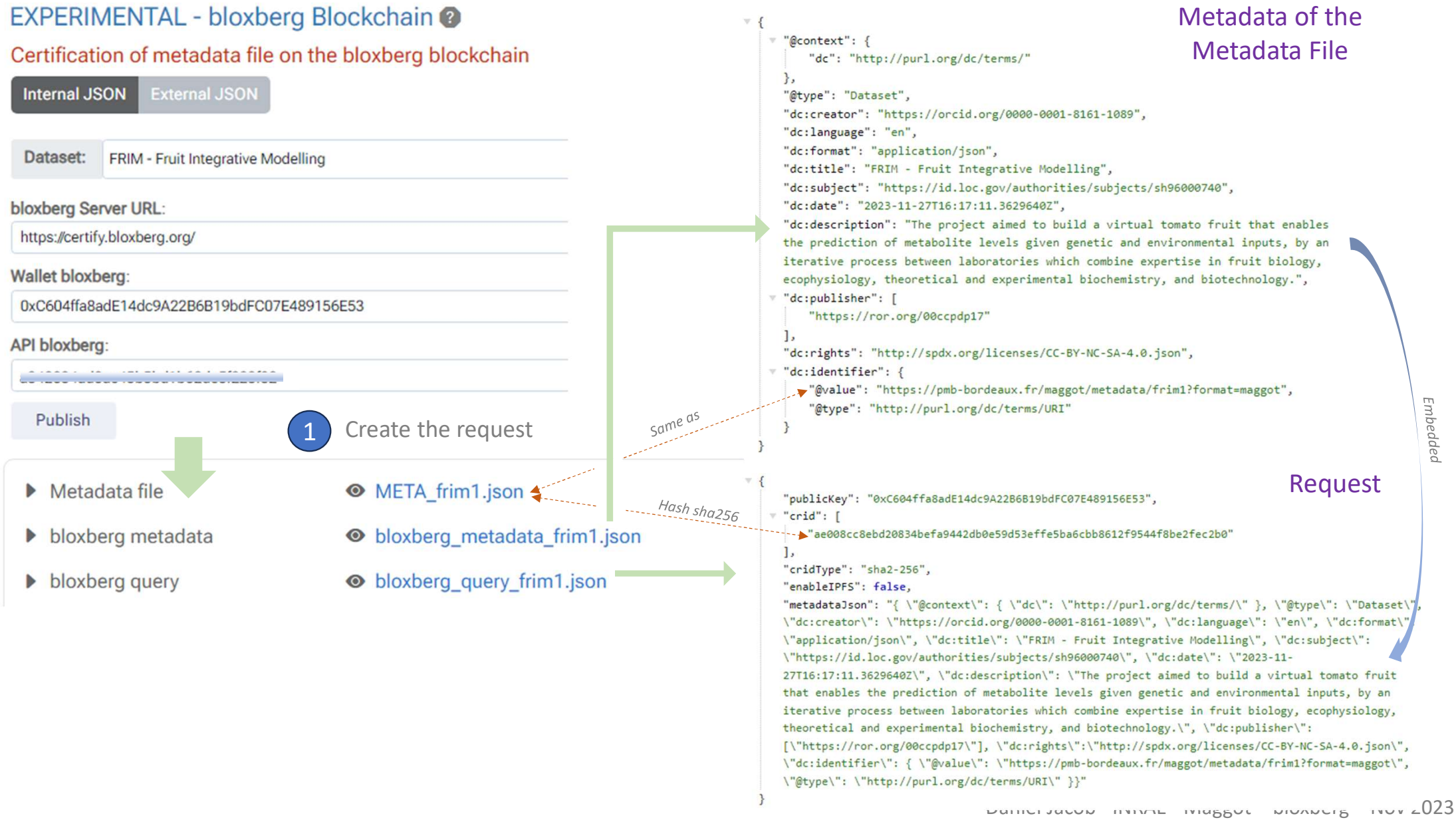
1 Create the request

- Metadata file — META_frim1.json
- bloxberg metadata — bloxberg_metadata_frim1.json
- bloxberg query — bloxberg_query_frim1.json

Same as

Metadata of the Metadata File


```
{
  "@context": {
     "dc": "http://purl.org/dc/terms/"
  },
  "@type": "Dataset",
  "dc:creator": "https://orcid.org/0000-0001-8161-1089",
  "dc:language": "en",
  "dc:format": "application/json",
  "dc:title": "FRIM - Fruit Integrative Modelling",
  "dc:subject": "https://id.loc.gov/authorities/subjects/sh96000740",
  "dc:date": "2023-11-27T16:17:11.3629640Z",
  "dc:description": "The project aimed to build a virtual tomato fruit that enables
  the prediction of metabolite levels given genetic and environmental inputs, by an
  iterative process between laboratories which combine expertise in fruit biology,
  ecophysiology, theoretical and experimental biochemistry, and biotechnology.",
  "dc:publisher": [
     "https://ror.org/00ccpdp17"
  ],
  "dc:rights": "http://spdx.org/licenses/CC-BY-NC-SA-4.0.json",
  "dc:identifier": {
     "@value": "https://pmb-bordeaux.fr/maggot/metadata/frim1?format=maggot",
     "@type": "http://purl.org/dc/terms/URI"
  }
}
```


EXPERIMENTAL - bloxberg Blockchain
Certification of metadata file on the bloxberg blockchain
Internal JSON
External JSON
Dataset:
FRIM - Fruit Integrative Modelling
bloxberg Server URL:
https://certify.bloxberg.org/
Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53
API bloxberg:
Publish
1
Create the request
Metadata file
bloxberg metadata
bloxberg query
META_frim1.json
bloxberg_metadata_frim1.json
bloxberg_query_frim1.json
Same as
Hash sha256
Metadata of the Metadata File
Request
Embedded

EXPERIMENTAL - bloxberg Blockchain

Certification of metadata file on the bloxberg blockchain

Internal JSON | External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:
https://certify.bloxberg.org/

Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

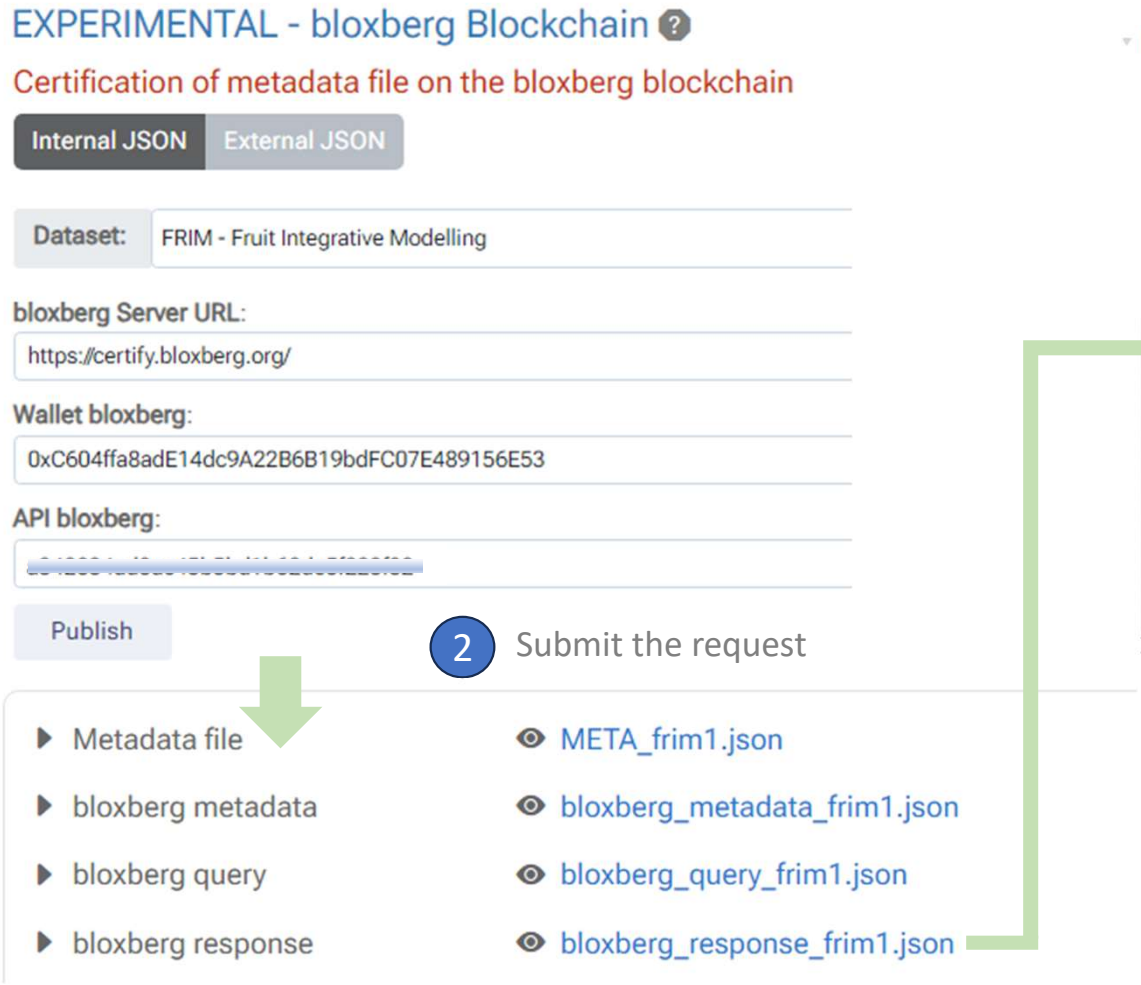
API bloxberg:
[redacted]

Publish

2 Submit the request

- Metadata file — META_frim1.json
- bloxberg metadata — bloxberg_metadata_frim1.json
- bloxberg query — bloxberg_query_frim1.json
- bloxberg response — bloxberg_response_frim1.json


```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    ...
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGu1qoKR3AS5A6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSJLwna4b9f4MNsJ634P7m51PW
      KYmUhEowJFpyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApgUDwDg86MWozSE4o76FhfDWKUKnTetca5f63Gebifrk8S9
      Ro1B4yN4QxF7PRqTPESaiUadffofXiwbxtTiQ7ipTQPuk5auhJbt1Sz4wCj3ELAfL4pYozYBUPVrNJgFWiVQxeTHR1NBqh
      C9JHxmrJfkuXJvL15aJEHWW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264b906093460923169643f45BDbC32e",
      "ens_name": "mpdl.berg"
    }
  }
]
```




```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    ...
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGu1qoKR3AS5A6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSJLwna4b9f4MNsJ634P7m51PW
      KYmUhEowJFpyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApgUDwDg86MWozSE4o76FhfDWKUKnTetca5f63Gebifrk8S9
      Ro1B4yN4QxF7PRqTPESaiUadffofXiwbxtTiQ7ipTQPuk5auhJbt1Sz4wCj3ELAfL4pYozYBUPVrNJgFWiVQxeTHR1NBqh
      C9JHxmrJfkuXJvL15aJEHWW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264b906093460923169643f45BDbC32e",
      "ens_name": "mpdl.berg"
    }
  }
]
```


Proof of Authority

Transactions and blocks are validated by approved accounts, known as validators.

However the process is automated and does not require validators to be constantly monitoring their computers.

https://en.wikipedia.org/wiki/Proof_of_authority

EXPERIMENTAL - bloxberg Blockchain

Certification of metadata file on the bloxberg blockchain

Internal JSON | External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:
https://certify.bloxberg.org/

Wallet bloxberg:
0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:
[redacted]

Publish

3 Retrieve the certificate

- Metadata file — META_frim1.json
- bloxberg metadata — bloxberg_metadata_frim1.json
- bloxberg query — bloxberg_query_frim1.json
- bloxberg response — bloxberg_response_frim1.json
- bloxberg certificate — bloxberg_certificate_frim1.zip

Success : the metadata file has been certified on the bloxberg blockchain
Download the ZIP which contains the corresponding certificate as a PDF file


```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    ...
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGu1qoKR3AS5A6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSJLwna4b9f4MNsJ634P7m51PW
      KYmUhEowJFpyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApgUDwDg86MWozSE4o76FhfDWKUKnTetca5f63Gebifrk8S9
      Ro1B4yN4QxF7PRqTPESaiUadffofXiwbxtTiQ7ipTQPuk5auhJbt1Sz4wCj3ELAfL4pYozYBUPVrNJgFWiVQxeTHR1NBqh
      C9JHxmrJfkuXJvL15aJEHWW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264b906093460923169643f45BDbC32e",
      "ens_name": "mpdl.berg"
    }
  }
]
```

https://inrae.github.io/pgd-mmdt/bloxberg/

https://bloxberg.org/