

世界のDOIの現状

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今日のあらまし

- DOIとは何か
- The DOI FoundationとRegistration Agency (RA)
- DOIのメカニズム

DOIとは

- DOIとは論文などのコンテンツを示す識別子
- DOI = Digital Object Identifier (system) ®
= Digital Identifier of an Object
- 「10.」で始まる各機関固有のDOI-prefix、
「/」（スラッシュ記号）、個々のコンテンツ
を特定するDOI-suffixで構成

DOIの例:  10.1241/johokanri.55.42

The diagram illustrates the structure of a DOI. It shows the example '10.1241/johokanri.55.42' with '10.1241' in green and 'johokanri.55.42' in red. Above '10.1241' is the label 'DOI-Prefix' in green with a blue arrow pointing down to it. Above 'johokanri.55.42' is the label 'DOI-Suffix' in red with a red arrow pointing down to it.

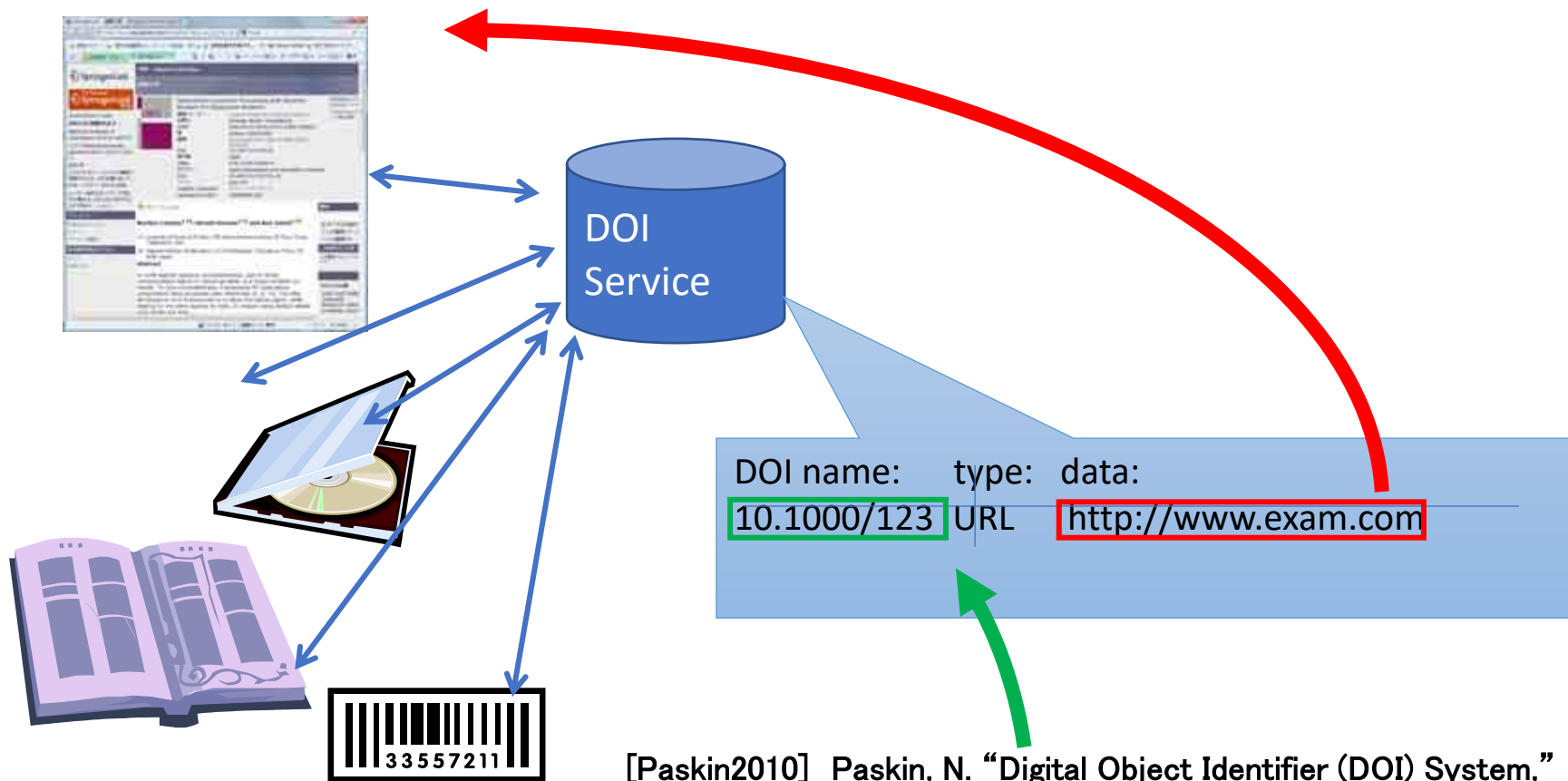
DOIの機能

- DOIの前に、「<https://doi.org/>」を付けることにより、URLとして機能する。

DOI-Prefix DOI-Suffix
↓ ↓
DOIの例: 10.1241/johokanri.55.42

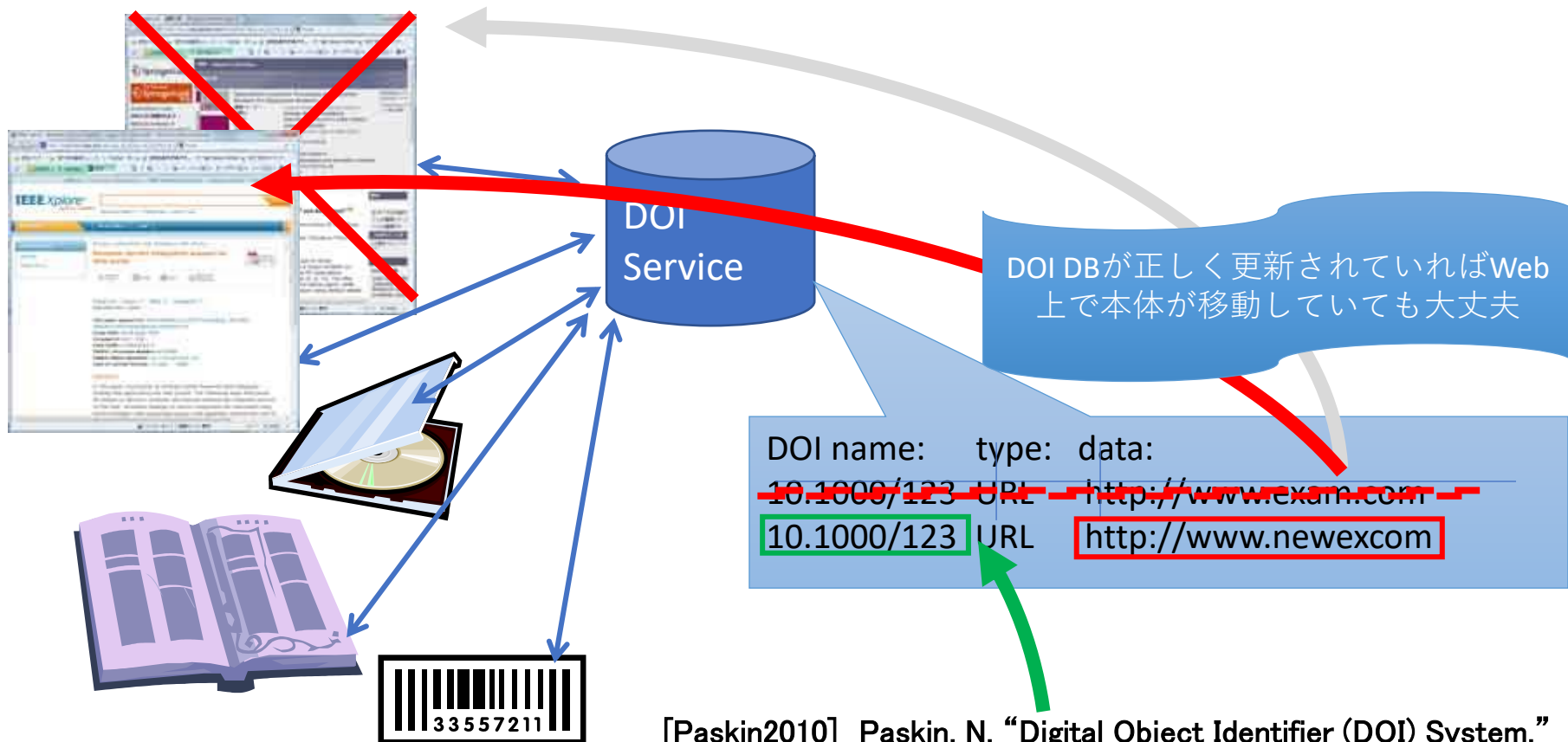
アクセスする際のURL ⇒ <https://doi.org/10.1241/johokanri.55.42>

DOIによるリンクの解決



[Paskin2010] Paskin, N. "Digital Object Identifier (DOI) System," Encyclopedia of Library and Information Sciences, Third Edition (2010). DOI: 10.1000/123

DOIによるリンク維持



[Paskin2010] Paskin, N. "Digital Object Identifier (DOI) System," Encyclopedia of Library and Information Sciences, Third Edition (2010). DOI: 10.1000/123

DOIの価値

- 解決可能(resolvable)
 - standard identifier syntax + network resolution mechanism (Handle System)
- 永続的(persistent)
 - 二つの永続性を担保する仕組み
 - 技術的なインフラストラクチャ (registry database, proxy support, etc)
 - 社会的なインフラストラクチャ (財団の運営、登録機関へ義務等)
- 総合運用性(interoperable)

DOIの発展

- URLのリンク切れ問題の解決として1990年代後半からDOIが創設された。
- 出版者らが設立したCrossRefにより電子出版分野で発展してきた。
- 現在では映像コンテンツ、研究データなどさまざまな分野でDOIが使われている。

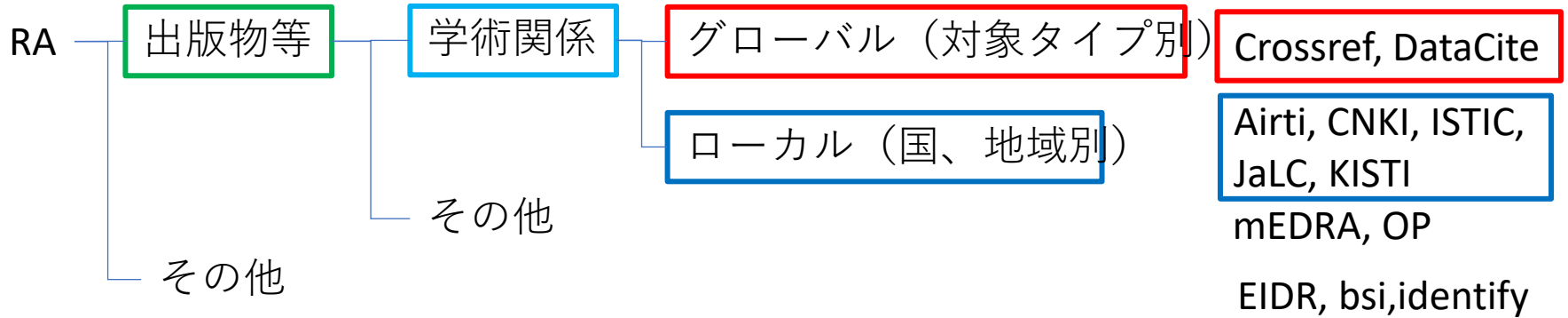
IDF(International DOI Foundation)

- DOIシステムはIDF (International DOI Foundation)によって運営
- IDFに直接DOIをデポジットできない
- DOIはRegistration Agencyを通じてのみ可能
- Registration Agencyの役割
 - Prefix登録、DOI登録維持業務
 - IDFの運営協力（資金）
 - 対象分野ごと

RAのビジネス

- RAは**自律的**で相互に**独立**
- RAの自身の顧客とのビジネスモデルは自分で決める
- RAのDOI財団への義務はライセンスと運用の合意
- 全てのRAは財団の**共通**のインフラストラクチャのコストを負担
- 全てのRAは共通の**標準**DOIシステムの実装
- RAはその上に自分の**サービス**を付加する
- RAはDOIをサービスの内部で使ってもいいし、明示的に”DOIによる”と呼称しても良い
- RAは商業的でも良い。多くのRAは自身のメンバーのコミュニティを持っている (e.g. CrossRef, EIDR, DataCite)

Registration Agency



[Airti, Inc.](#)



[Crossref](#)



[JaLC \(Japan Link Center\)](#)



[Korea Institute of Science and Technology Information \(KISTI\)](#)



[China National Knowledge Infrastructure \(CNKI\)](#)



[DataCite](#)



[mEDRA \(Multilingual European DOI Registration Agency\)](#)



[Publications Office](#)

[OP \(Publications Office of the European Union\)](#)



[EIDR \(Entertainment Identifier Registry\)](#)



[ISTIC & Wanfang Data \(The Institute of Scientific and Technical Information of China & Wanfang Data Co., Ltd.\)](#)



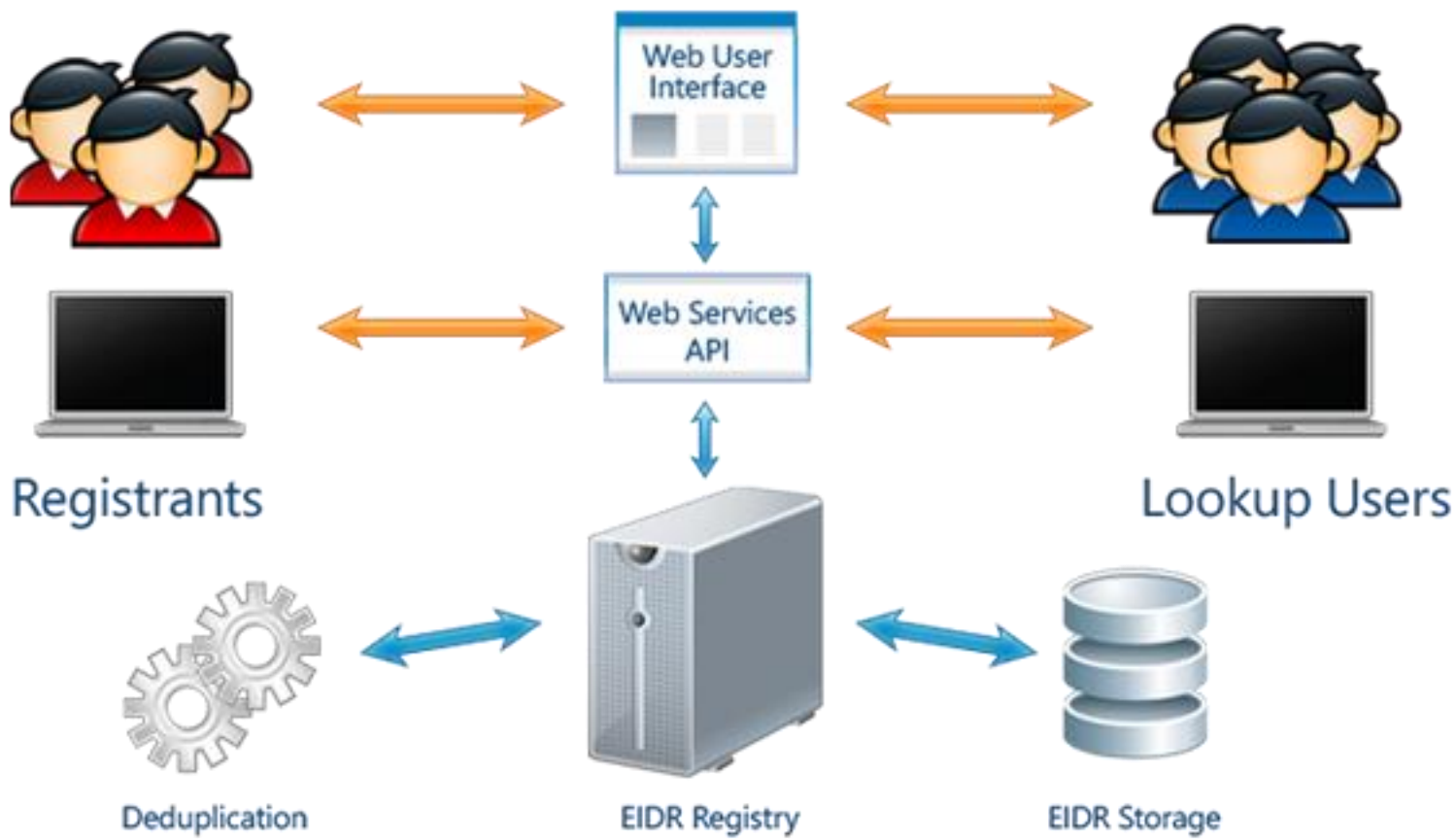
[BSI Identify](#)

Registration Agencies

- Airiti, Inc
 - 繁体中国語資料へのDOI付与
- BSI Identify
 - 建築関連製品へのDOI付与
- CNKI (Chinese Knowledge Knowledge Infrastructure)
 - 中国で発行された学術出版物、情報源へのDOI付与
- CrossRef
 - 学術的な専門的な研究コンテンツ
 - 雑誌論文、図書、学会予稿など
 - 引用リンク、検索可能なメタデータデータベース
- DataCite
 - 研究データセットに関するDOI付与。
- EIDR
 - 映画、テレビ番組、商業音声／映像資料へのDOI付与
- ISTIC & Wanfang Data Co., Ltd.
 - 中国語雑誌と科学データへのDOI付与
- Japan Link Center (JaLC)
- Korea Institute of Science and Technology Information (KISTI)
 - 韓国での出版物、学術データへのDOI付与
- mEDRA
 - イタリアおよびヨーロッパのインターネット上の資源へのDOI付与
 - 知的所有実体（intellectual property entities）相互の関係トラッキング
 - タイムスタンプや電子署名の認定
- OP (Publications Office of the European Union)
EU 配下組織の出版物のためのDOI 管理を通じ、EU の公式パブリッシャーとして機能

Entertainment Identifier Registry(EIDR)

- 映画、テレビ番組など映像リソースを管理
- それらに識別子を付与



Content

Parties

Video Services

☒ Use ASCII search | Results per page 25 ▾

Title

Mononoke

Language

... ▾

Title Class

... ▾

Referent Type

... ▾

Registrant

Start typing to view a list

Country of Origin

... ▾

☐ Exact Title Match

☒ Include Alternate Titles

Associated Org Name

Associated Org ID

Role

... ▾

Director

Actor

Actor #2

☒ Include Alternate Names

Start typing to view a list

Last Modified (From)

/ /

YYYY [/ MM / DD]

Last Modified (To)

/ /

YYYY [/ MM / DD]

Release Date (From)

/ /

YYYY [/ MM / DD]

Release Date (To)

/ /

YYYY [/ MM / DD]

Create Date (From)

/ /

YYYY [/ MM / DD]

Create Date (To)

/ /

YYYY [/ MM / DD]

Alternate ID Type

... ▾

Alternate ID

Alternate ID Relation

... ▾

Inheritance Relationships

... ▾

☐ Select/Deselect All

☐ Root Abstraction Records

☐ Episode Abstraction Records

☐ Series Records

☐ Other Root Records

Alternate ID Domain

Lightweight Relationships

... ▾

Dependence Relationships

... ▾

[Content Results](#)
[Refine Content Search](#)
[Parties](#)
[Video Services](#)

6 Results.

Page size: 6

Content ID	Title	Title Lang.	Ref. Type	Relationships	Original Lang.	Lang Mode.	Structural Type	Release Date
10.5240/6EE5-C32A-390D-955E-9150-G	Mononoke	fr	Series		ja	Audio	Abstraction	2007
10.5240/6325-DF5E-D272-834B-6AC3-C	Mononoke-hime	ja	Movie	isEditOf (10.5240/45D0-68B8-46E3-7E42-6D26-X)	ja en	Audio Audio	Performance	1999-11-26
10.5240/B54E-1AB3-6F58-38FC-C4B9-S	Mononoke-hime	ja	Movie	isEditOf (10.5240/45D0-68B8-46E3-7E42-6D26-X)	ja en	Audio Audio	Performance	1997
10.5240/45D0-68B8-46E3-7E42-6D26-X	Mononoke-hime	ja	Movie		ja en	Audio Audio	Abstraction	1997-07-12
10.5240/20E3-9196-5FB2-C20D-6E09-V	Mononoke-hime	ja	Movie	isEditOf (10.5240/45D0-68B8-46E3-7E42-6D26-X)	ja en	Audio Audio	Performance	1999
10.5240/ECB0-E6D4-DA11-1CE4-30A0-R	Mononoke-hime	ja	Movie	isEditOf (10.5240/45D0-68B8-46E3-7E42-6D26-X)	ja en	Audio Audio	Performance	1999

6 Results.

Page size: 6

VIEW

[View XML](#)
[Metadata](#)
[Relationships](#)

BASE OBJECT DATA

EIDR ID	10.5240/45D0-68B8-46E3-7E42-6D26-X		
Structural Type	Abstraction		
Mode	AudioVisual		
Referent Type	Movie		
Title	Mononoke-hime		
	Lang: ja	Title Class: transliterated	
Alternate Title	Princess Mononoke		
	Lang: en	Title Class: regional	
Alternate Title #2	もののけ姫		
	Lang: ja	Title Class: release	
Original Language	ja		
	Mode: Audio	Type: primary	
Original Language #2	en		
	Mode: Audio		
Associated Org	Studio Ghibli		
	ID Type: EIDRPartyID	Party ID: 10.5237/00B3-C33F	Role: producer
Associated Org #2	nippon television network corporation		
	ID Type: EIDRPartyID	Party ID: 10.5237/2ABB-BBBA	Role: producer
Alternate Name	NTV		
Alternate Name #2	nippon television network		
Associated Org #3	Tokuma Shoten		
	ID Type: EIDRPartyID	Party ID: 10.5237/CECB-785B	Role: producer
Associated Org #4	Miramax		
	Role: producer		
Associated Org #5	Nippon TV		
	Role: producer		

Put safety first. Reduce customer risk with the digital identification service that provides accurate product verification and information

1

BSI Identify issues manufacturers with a unique, enduring and traceable identifier called a BSI UPIN (Universal Persistent Identification Number) to every product that's specified and incorporated in a building structure.

2

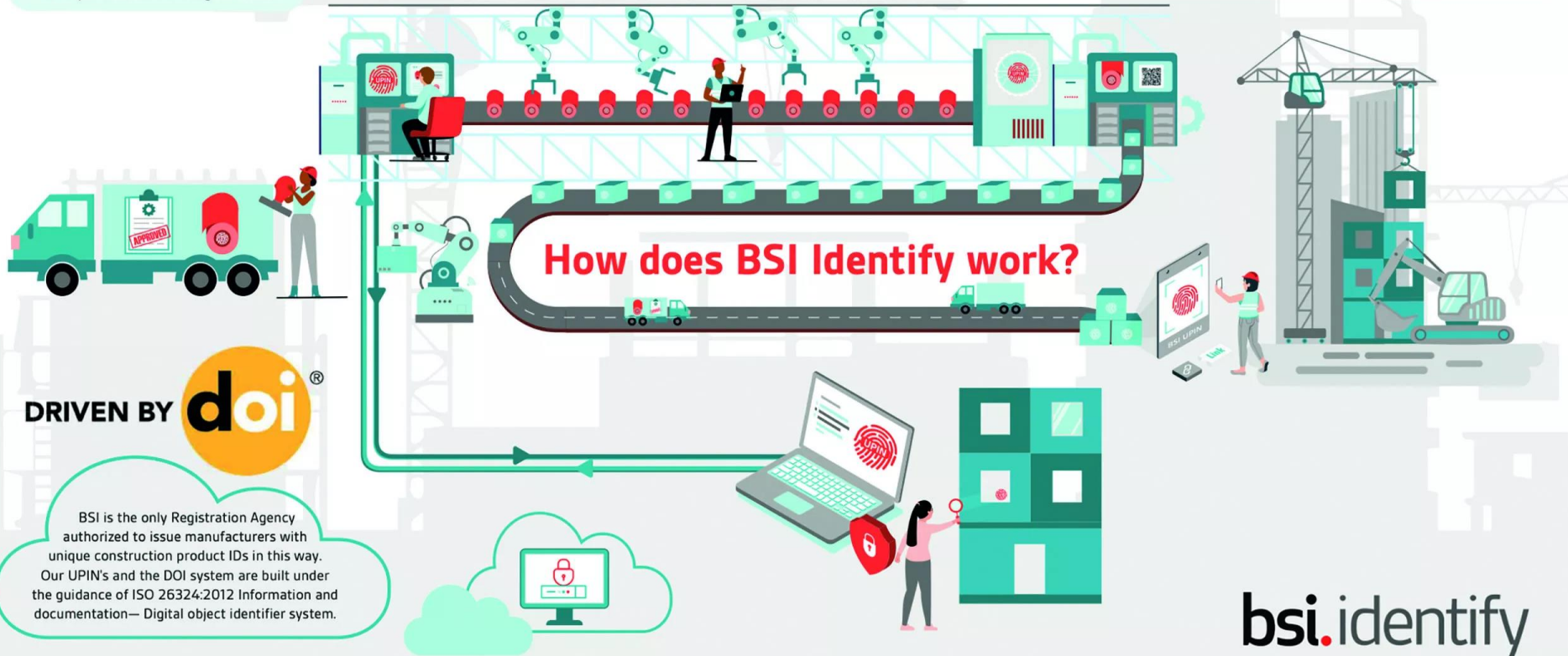
It holds these UPINs in an accessible and searchable registry. The technology used ensure that the link cannot be broken.

3

The manufacturer can then mark or tag their products with the UPIN. They can be included on the physical product via labels, within QR codes, NFC or RFID tags, as well as in any digital records of a building.

4

The BSI UPIN then acts as a smart link that can signpost users to a product landing page where they can quickly find all the most up-to-date information on a product. The manufacturer is in control of this open-access page, ensuring that there's one single definitive source of information on the product.



Results for "pipe"

🔍 pipe

We found 9 results related to your search.

Recoup Pipe HEX Be

Recoup

UPIN 10.21/MHD95S66 📄

The Recoup Pipe HEX Be is a Vertical Waste Water Heat Recovery System (WWHRS) that connects below a shower. The Recoup Pipe HEX Be uses the residual heat from the waste shower water transferring it to incoming cold water via its heat exchanger to produce preheated water. This preheated water is then sent to the shower and/or the water heater. Energy is saved that would otherwise go down the drain and less energy is used to heat water to the required temperature. The Pipe HEX Be is the bespoke-sized version of the longer Recoup Pipe HEX and Recoup Pipe HEX Rd.

Length: less than 1.7m Width: 63mm Material: PVC Outer Colour: Grey



Recoup Pipe HEX Rd

Recoup

UPIN 10.21/TJ2ZP8Q2 📄

The Recoup Pipe HEX Rd is a Vertical Waste Water Heat Recovery System (WWHRS) that connects below a shower. The Recoup Pipe HEX Rd uses the residual heat from the waste shower water transferring it to incoming cold water via its heat exchanger to produce preheated water. This preheated



Filter results

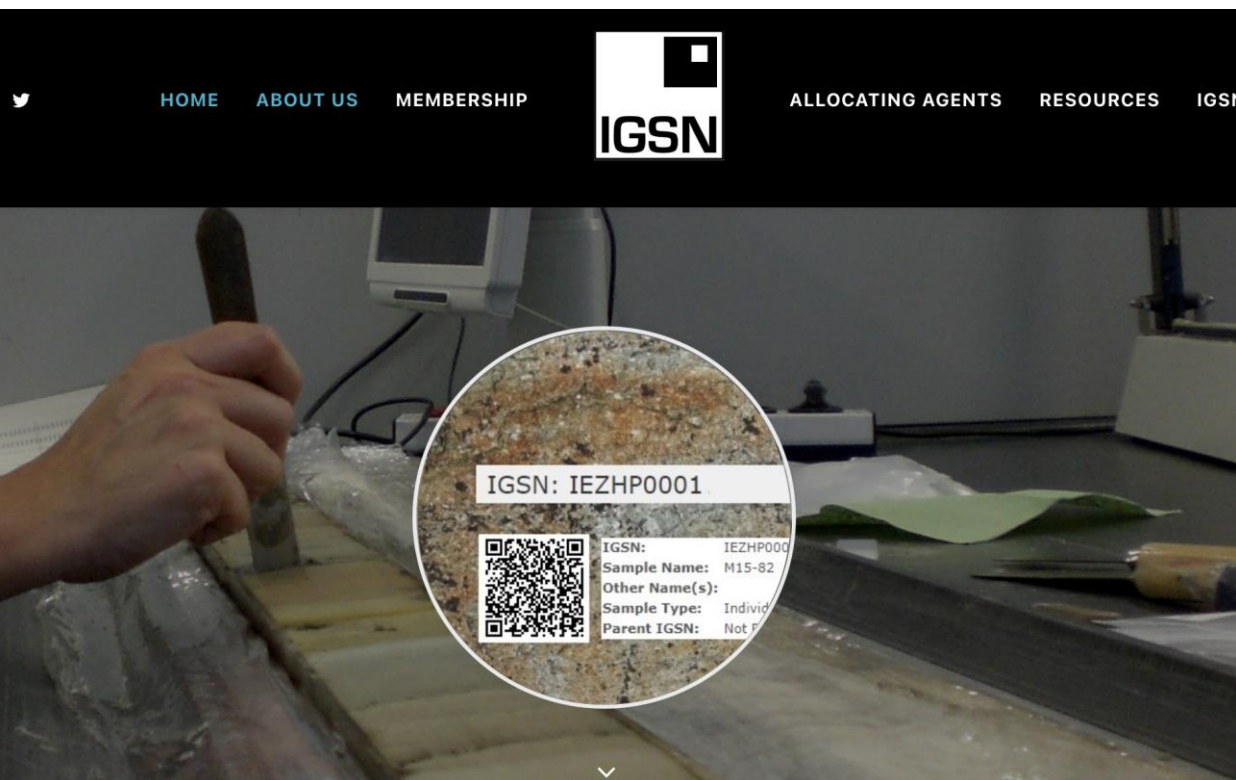
- Brand name ▾
- Classifications name ▾
- Classifications value ▾
- Manufacturer ▾

Apply filters

ISGN(International Generic Sample Number)

- 岩石などの標本に対する識別子
- DateCiteを通じてDOIを付与

<http://doi.org/10273/ICDP5054ESYI201>



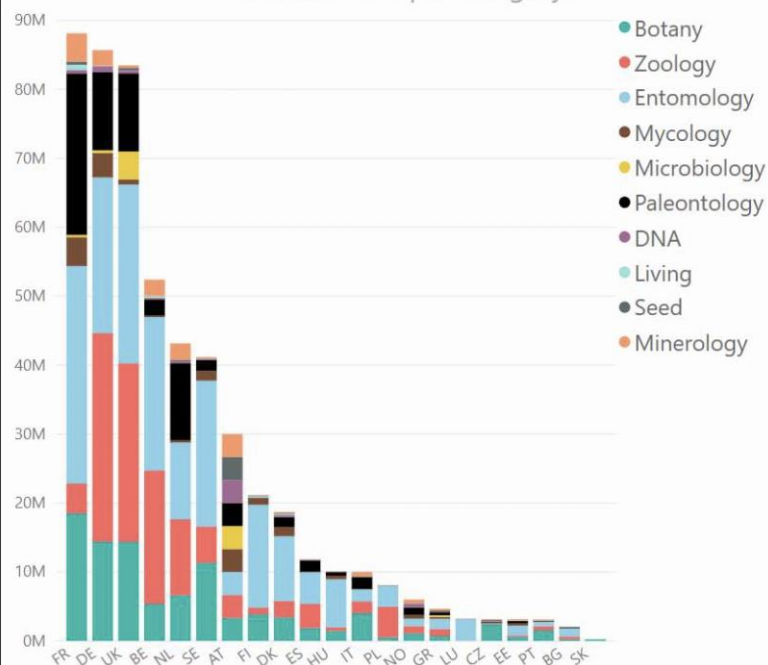
DiSSCo

- 標本などの科学コレクションのDB
- DOIを採用予定

Distributed System of Scientific Collections

1,5 billion specimens. 5,000 scientists.
170+ institutions. 23 countries
... in 1 European collection.

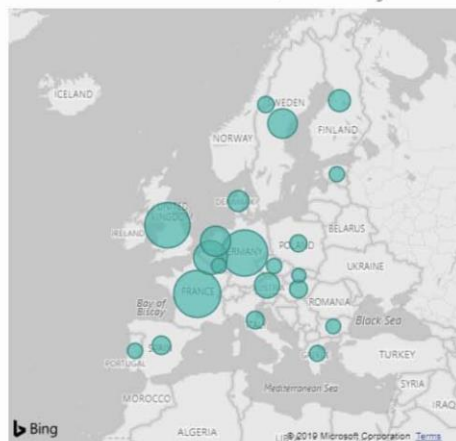
Collection size per category



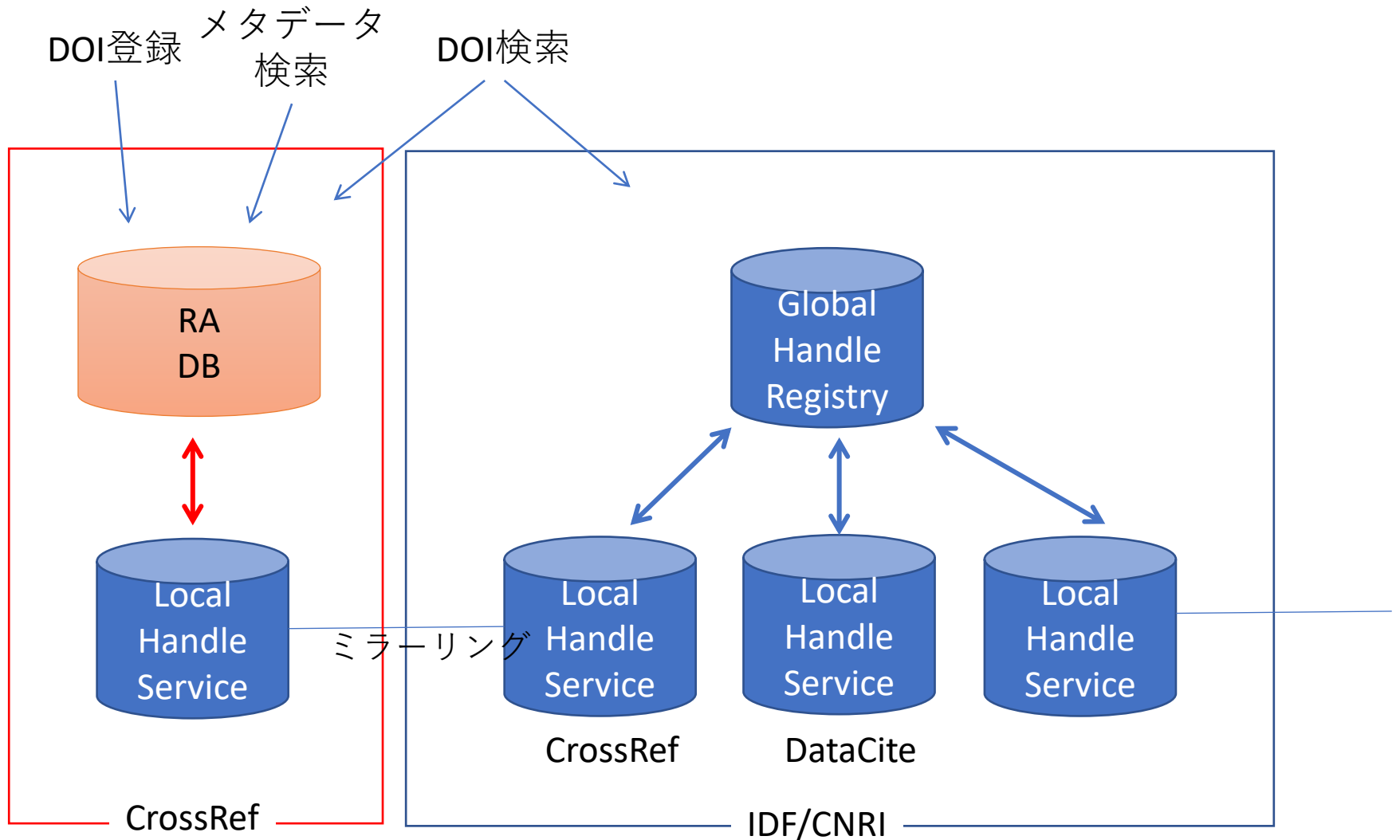
DiSSCo

A world-class research infrastructure

Collection size / country



DOIの技術的仕組み



DOIの運用インフラストラクチャ (2021/1)

- DOI Prefixes: > 150,000
- DOIs: > 238,000,000
- DOI Resolution Service
 - 12 Handle Services (10 RAs + 1 Default for test/shortDOI etc + 1 for 2 two-delimiter prefixes)
 - 55 Individual Servers
 - Amazon Cloud Services
 - CoLo used by CNRI
 - Total Primary Servers: 20
 - 14 managed by CNRI (4 CoLo, 10 cloud)
 - 6 managed by various RAs
 - Total Secondary Servers: 35
 - 34 managed by CNRI (11 CoLo, 23 cloud)
 - 1 managed by an RA
- All servers are monitored by CNRI custom Nagios service plus commercial Pingdom service

DOIの運用インフラストラクチャ(2021/1)

- DOI Resolutions in 2020: > 7.97 billion
 - New high of close to a billion resolutions in May 2020.
- Proxy Servers (doi.org): Depending on the proxy load, servers are automatically scaled. Minimum 8 servers.
 - 2 servers in 4 regions managed by CNRI (4 regions on AWS Elastic Beanstalk)

Cloudflare

January 2021 Stats Overview

- Total requests through Cloudflare: 878M (January)
 - Cached Requests: 207M
 - Uncached Requests: 671M
- Unique Visitors: 27M
 - Max unique visitors per day: 1.8M
- Requests by country
 - United States: 412M
 - China: 103M
 - Germany: 44M
 - Ireland: 43M
 - United Kingdom: 35M
- 51,185 Challenged Requests
 - United States (32,759 requests)
 - Singapore (4,748 requests)
 - China (4,626 requests)

* All numbers listed above are approximated to nearest million

まとめ

- DOI適用の広がり
 - 元々、必ずしも学術オンリーではない
 - 学術外でもユニークな使い方がなされている
 - BSI Identify
 - EIDR
 - 学術の分野でも対象が広がっている
 - IGSN
 - DiSSCo
- DOIシステムの運用の安定性
 - コアなシステムの安定性(handle system)
 - スケーラブルな運用体制