Japan Sets Organizational and Technological Direction

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Presentation Agenda

01 **Breakthrough Initiative with GDN Community**

Our two-years journey up to now – a small first-step but break-through the isolated situation

02 **Organizational Direction**

How Japan organizationally moves forward for student data portability – discussion and conclusion

03 **Technological Direction**

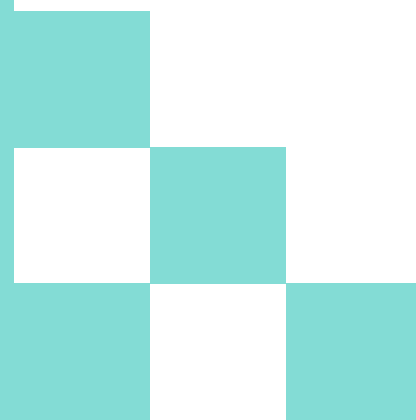Where Japan technologically moves forward for student data portability – discussion and conclusion
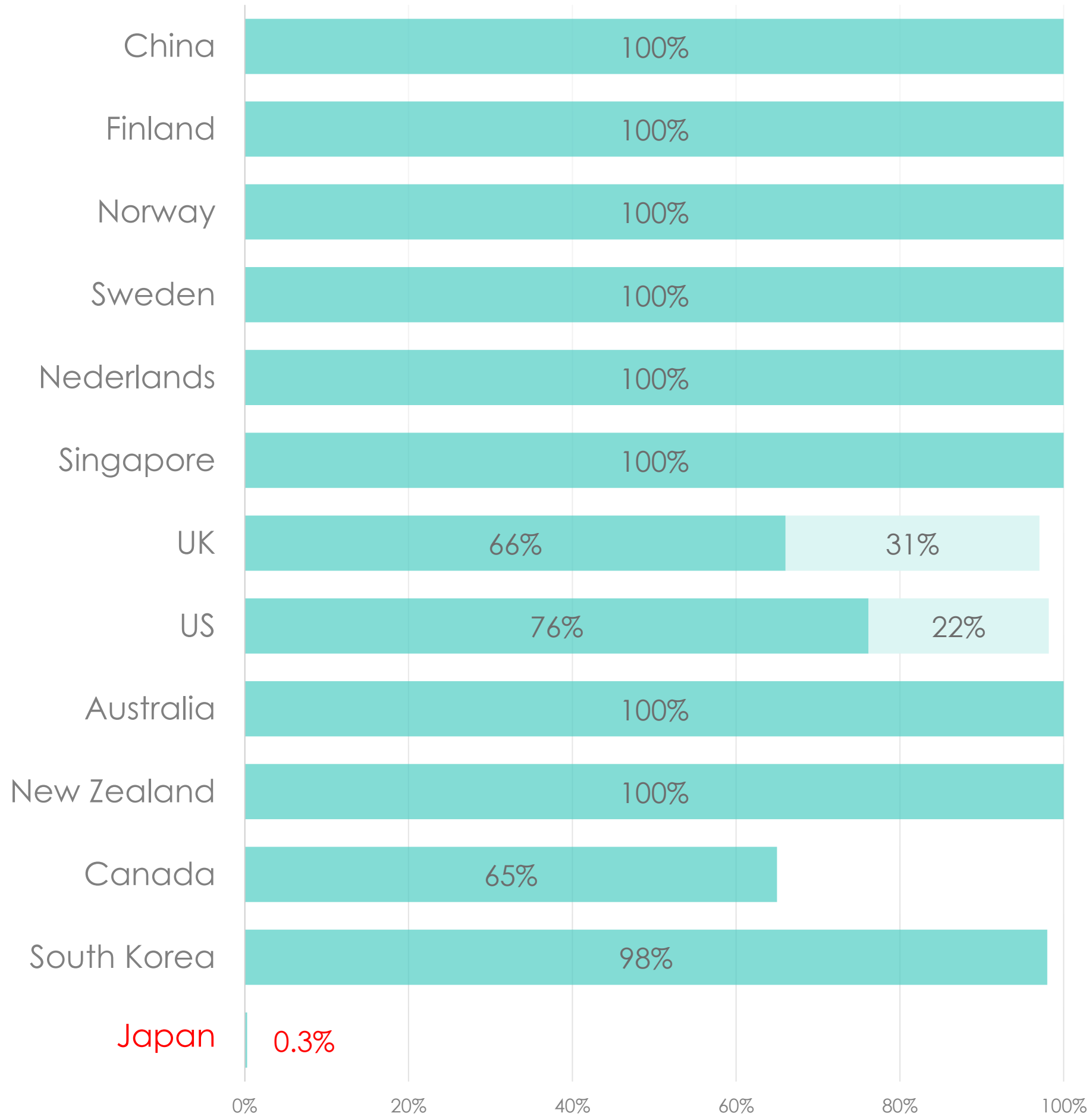
04 **Through Nation-wide Momentum**

Recent development through national-wide momentum

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Breakthrough with GDN Community

Digitized Rates

Country	Digitized Rate
China	100%
Finland	100%
Norway	100%
Sweden	100%
Nederlands	100%
Singapore	100%
UK	66% + 31%
US	76% + 22%
Australia	100%
New Zealand	100%
Canada	65%
South Korea	98%
Japan	0.3%

Percentage of universities who had digitized macro-credentials with both issuing and verification services in March 2022

Percentage of universities who had digitized macro-credentials with verification service only in March 2022

Note:

- All rates (except Japan) are rough estimates based on limited qualitative interviews.

- No rate (ecept Japan) is quantatively or comprehensively surveyed or validated.

Our Breakthrough Initiative with GDN Community

Zero Digitized

JAN 2020

❑ There was NO single education institution who had digitized credential in Japan.
❑ It is often called as 'lock-step mentalities'

JAN 2020

Joining the GDN Community

❑ Thanks to:
  ▪ Herman de Leeuw (GDN)
  ▪ Simone Ravaioli (Digitary)
  ▪ Tor Fridell (EMREX)
  ▪ Valère Meus (EWP)

Taking Initiative

MAR 2020

❑ Thanks to:
  ▪ Jay Segeth, Andrew Trnacek (Higher Ed Services)
  ▪ Anthony Manahan (Universities Australia)
  ▪ Neil Robinson (University of Melbourne)
  ▪ James Murray-Beckman, Takis Diakoumis (Digitary)

OCT 2021

Breakthrough

Our initiative delivered Japan's first digital credentials at:
- ❑ International Christian University (ICU)
- ❑ Shibaura Institute of Technology (SIT)

a small first step but psychologically broken through the isolated situation and moving on people's interests and activities for DSDP

MAR 2022

Direction-setting Research

- ❑ Research project to set direction for nation-wide implementation of student data portability was conducted (commissioned by MEXT)
- ❑ Thanks to:
  - ▪ Joanne Duklas, Charmaine Hack (ARUCC)
  - ▪ Li Xiaoshu (Susan), Chen Wenjun (Edward) (CSSD)
  - ▪ Shelby Stanfield, Mark Koveleski (NSC)
  - ▪ Emma Irving (Jisc)

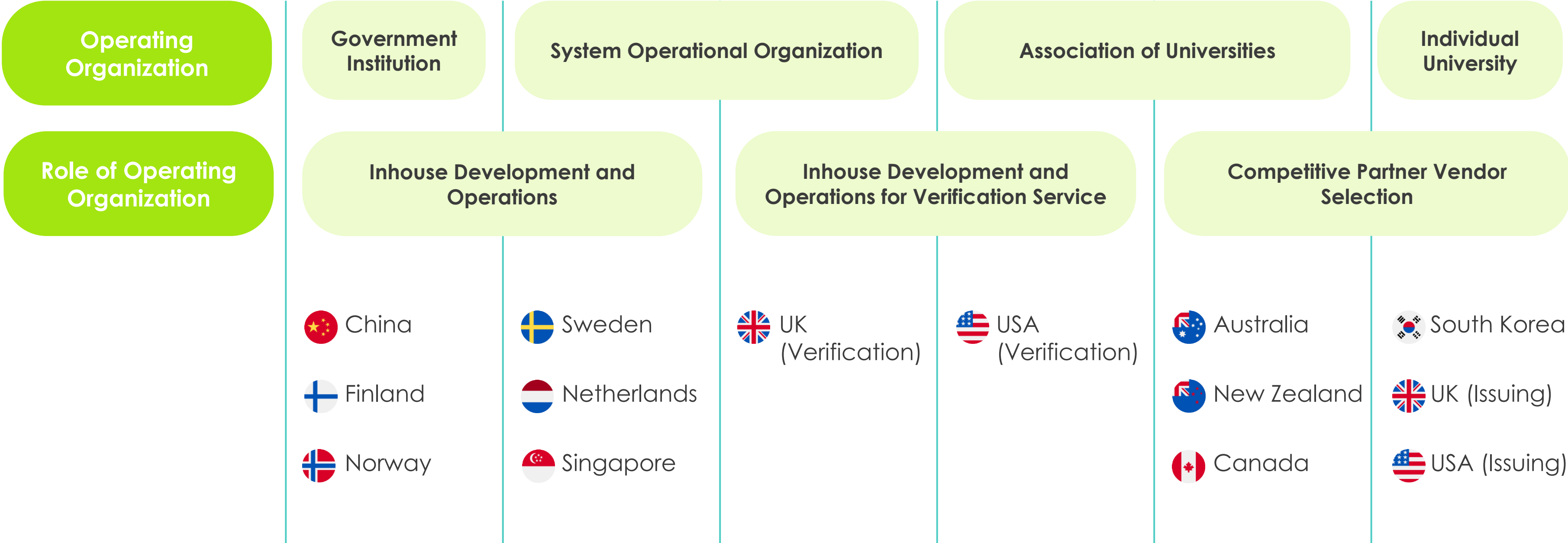# Through Nation-wide Momentum

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Organizational Direction
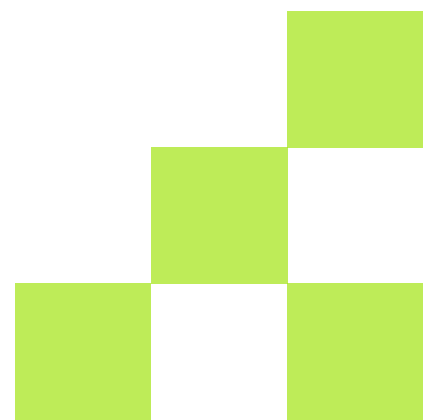
Misperception 2 Years Ago

Only the government could lead and manage nation-wide digitization.

Global Landscape of Organizational Approaches

Operating Organization	Government Institution	System Operational Organization		Association of Universities	Individual University
Role of Operating Organization	Inhouse Development and Operations		Inhouse Development and Operations for Verification Service	Competitive Partner Vendor Selection	

🇨🇳 China	🇸🇪 Sweden	🇬🇧 UK (Verification)	🇺🇸 USA (Verification)	🇦🇺 Australia	🇰🇷 South Korea
🇫🇮 Finland	🇳🇱 Netherlands			🇳🇿 New Zealand	🇬🇧 UK (Issuing)
🇳🇴 Norway	🇸🇬 Singapore			🇨🇦 Canada	🇺🇸 USA (Issuing)

Discussions

0 UK/ANZ/Canada hybrid model was initially recommended

❑ An independent agency to fund for the first 2 years (UK model)

❑ A universities association to select a vendor by international competition and to mange the nation-wide implementation process (ANZ and Canadian model)

Discussion 1: Who can manage the nation-wide 780 universities digitization process?
■ Which Japanese organization is as capable as UK Jisc, ANZ HES and Canadian ARUCC
■ An information system organization, universities associations were recommended and assessed as a candidate but declined
■ Leadership capability over higher education institutions for IT business operating capability was questioned

Discussion 2: Government-led centrally-managed process really works?
■ NSC in the US, MyeQuals in ANZ, MyCreds in Canada all started from voluntary initiative
■ 780 universities' financial situation and SIS are so diverse that diverse approaches should work better
■ Competition and good citizenship can incentivize here (government-led centrally managed approach does not really work for)

Organizational Direction

01   Market Stimulus with Interoperability

❏ Primarily to encourage individual institution's voluntary initiative

❏ Market stimulus to incentivize voluntary initiative

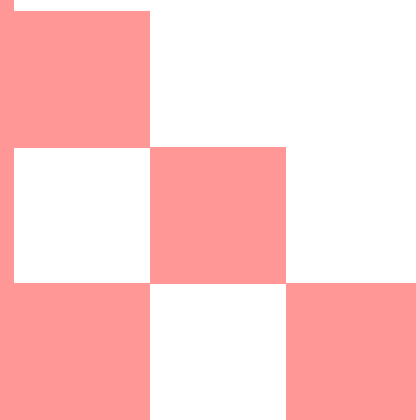❏ Thought-leadership for interoperability across each institution's voluntary initiatives

02   ANZ/Canadian Model Funded by Government

❏ Only when many universities voluntarily form an association to jointly select a vendor and manage the digitization process, government funds may be granted.

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Technological Direction

Terminological Confusions 2 Years Ago

A national data format should be defined

How Blockchain is related to digital credentials?

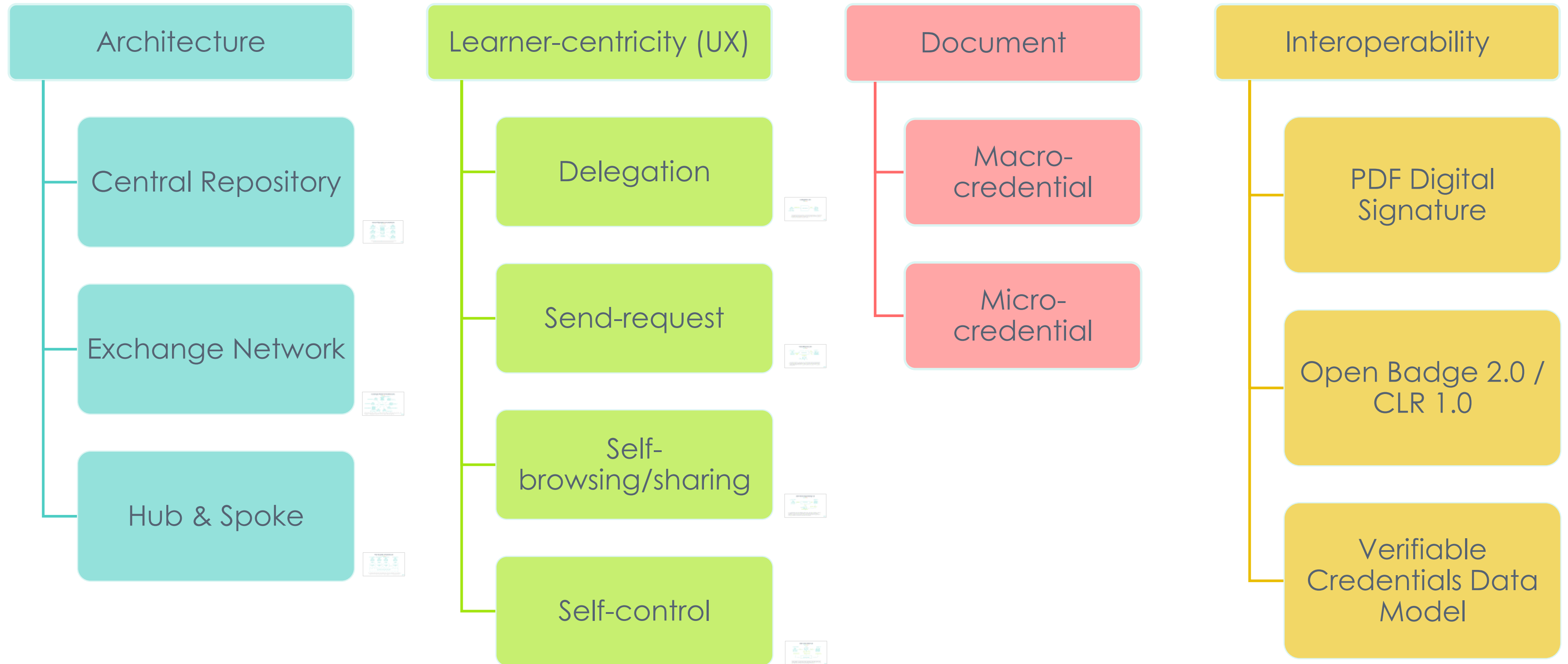A new network should be built for all HEIs and corporates

It should be connected with social securities cards

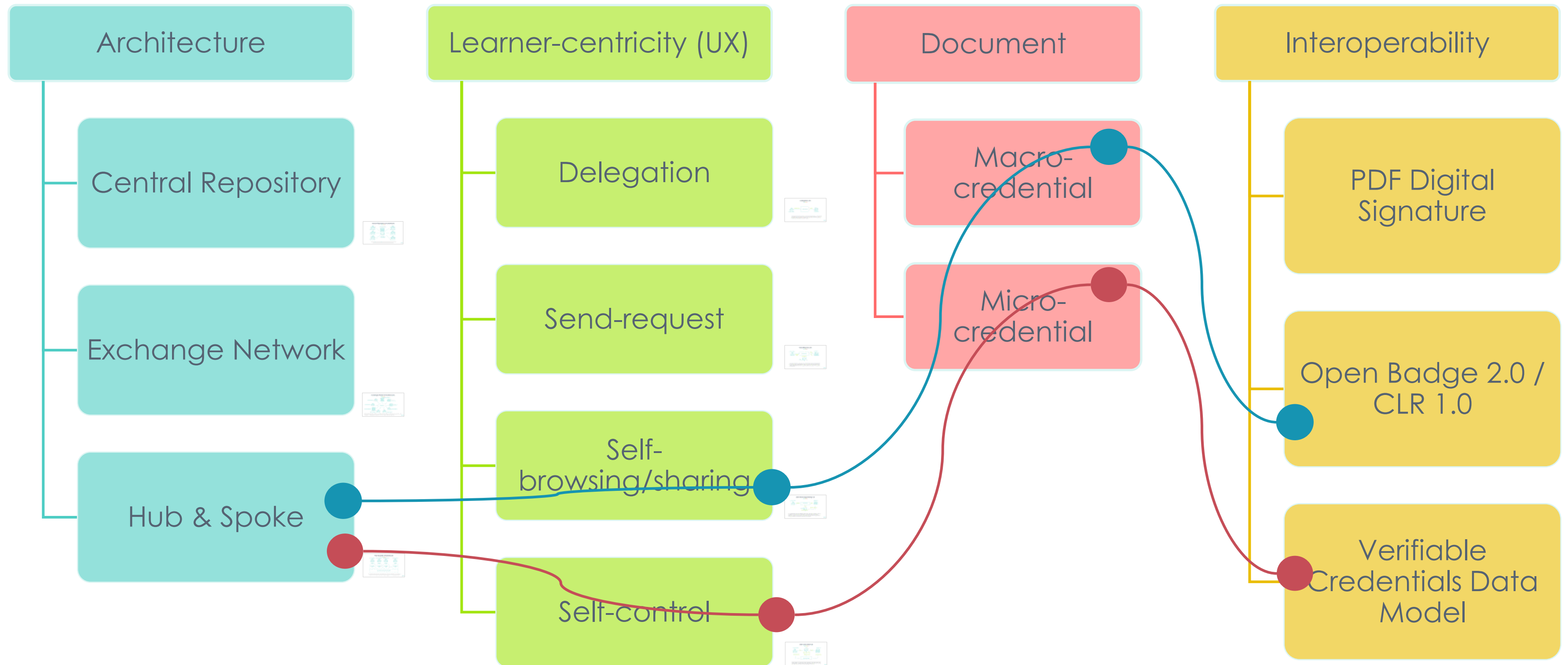MOOCs – how it is related to digital credentials?

What is the difference between micro-credential and open badge?

A national central repository is required

Terminological Commonization

Architecture	Learner-centricity (UX)	Document	Interoperability
Central Repository	Delegation	Macro-credential	PDF Digital Signature
Exchange Network	Send-request	Micro-credential	Open Badge 2.0 / CLR 1.0
Hub & Spoke	Self-browsing/sharing		Verifiable Credentials Data Model
	Self-control		

Terminological Commonization

Architecture
- Central Repository
- Exchange Network
- Hub & Spoke

Learner-centricity (UX)
- Delegation
- Send-request
- Self-browsing/sharing
- Self-control

Document
- Macro-credential
- Micro-credential

Interoperability
- PDF Digital Signature
- Open Badge 2.0 / CLR 1.0
- Verifiable Credentials Data Model

PDF Digital Signature

High versatility, simplicity, penetration rate, and security, legalized in each country (Electronic Signature Law, eIDAS etc.)

Fragmented Data Formats

❑ 6 types of data format within the US

❑ UK national format, ELMO etc.

Open Badge 2.0 / CLR 1.0

❑ Stewardship by 1EdTech (ex-IMS Global)

❑ IMS Japan is as large as 70 IT firms and institutional members

❑ CLR: Comprehensive Learner Records

Blockchian Credentials

❑ Blockcerts at MIT in 2018 was a pioneering use case

❑ Global Credentials Consortium (DCC) and other activities work with the GDN for interoperability

Verifiable Credentials

Coverging trend into the W3C Verifiable Credential Data Model

Technological Direction

PDF Digital Signature

❑ Potable, easy-to-use, scalable, high versability
❑ Low cost to interface with Student Information System (SIS)
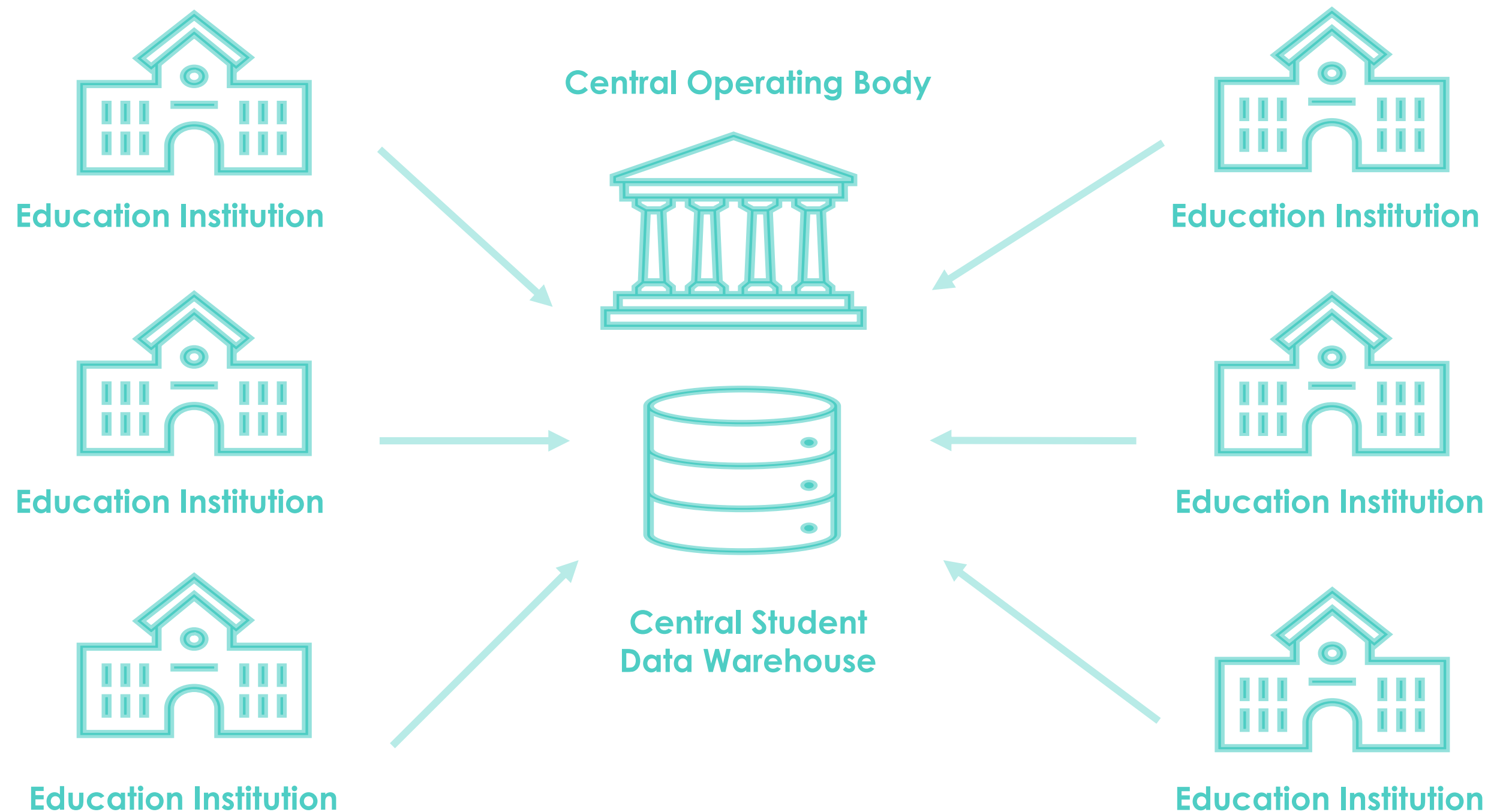❑ Legally authorized such as the Digital Signature Law in Japan, eIDAS in Europe

OpenBadge 2.0 / CLR1.0

❑ Interoperable, fit-in SNS behaviours
❑ An interim until VC-compliant OpenBadge 3.0 / Comprehensive Leaner Records 2.0 will be ready to go live
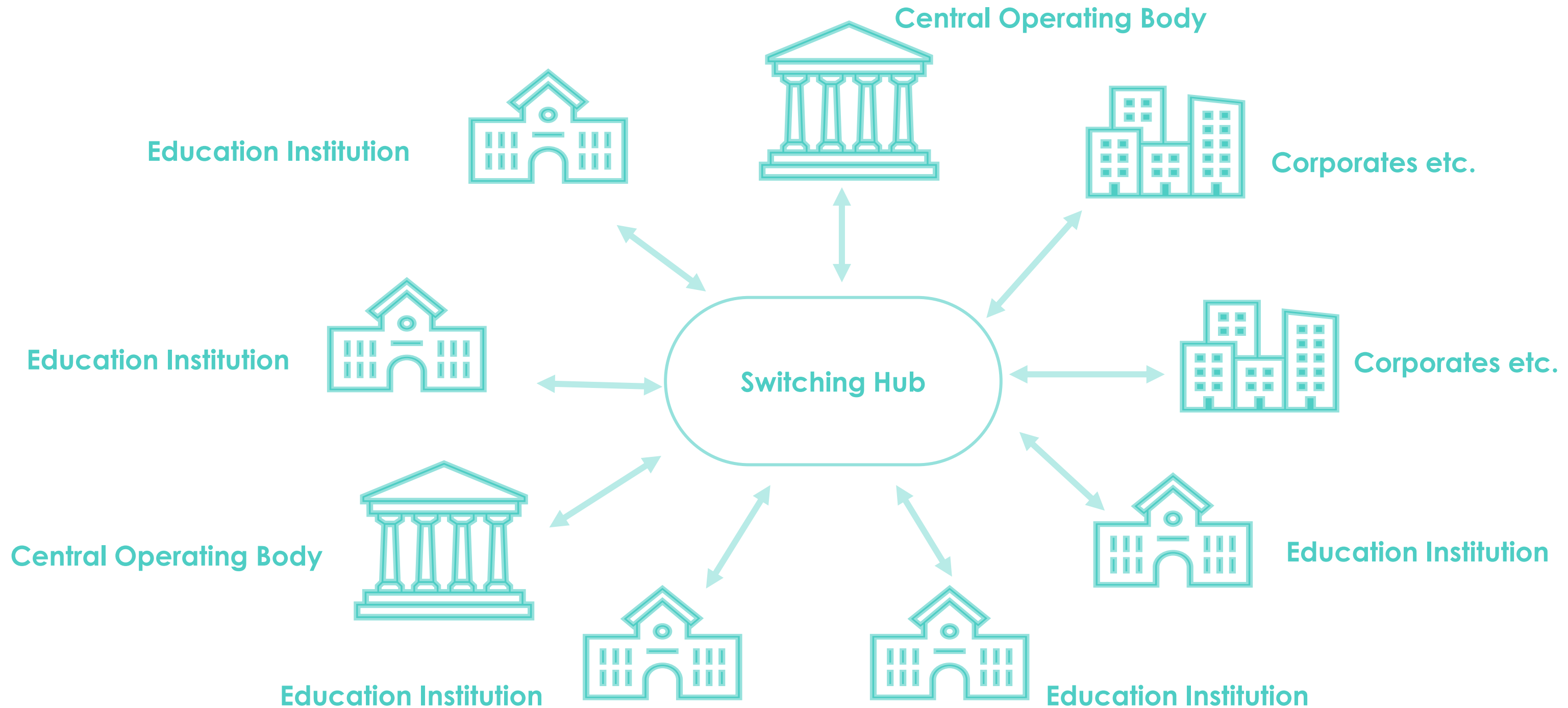
Verifiable Credentials

❑ Solid solution for fragmented data formats
❑ OpenBadge 3.0 / CLR 2.0 commitment commit to conform

Central Repository Architecture

Education Institution

Education Institution

Education Institution

Central Operating Body

**Central Student
Data Warehouse**

Education Institution

Education Institution
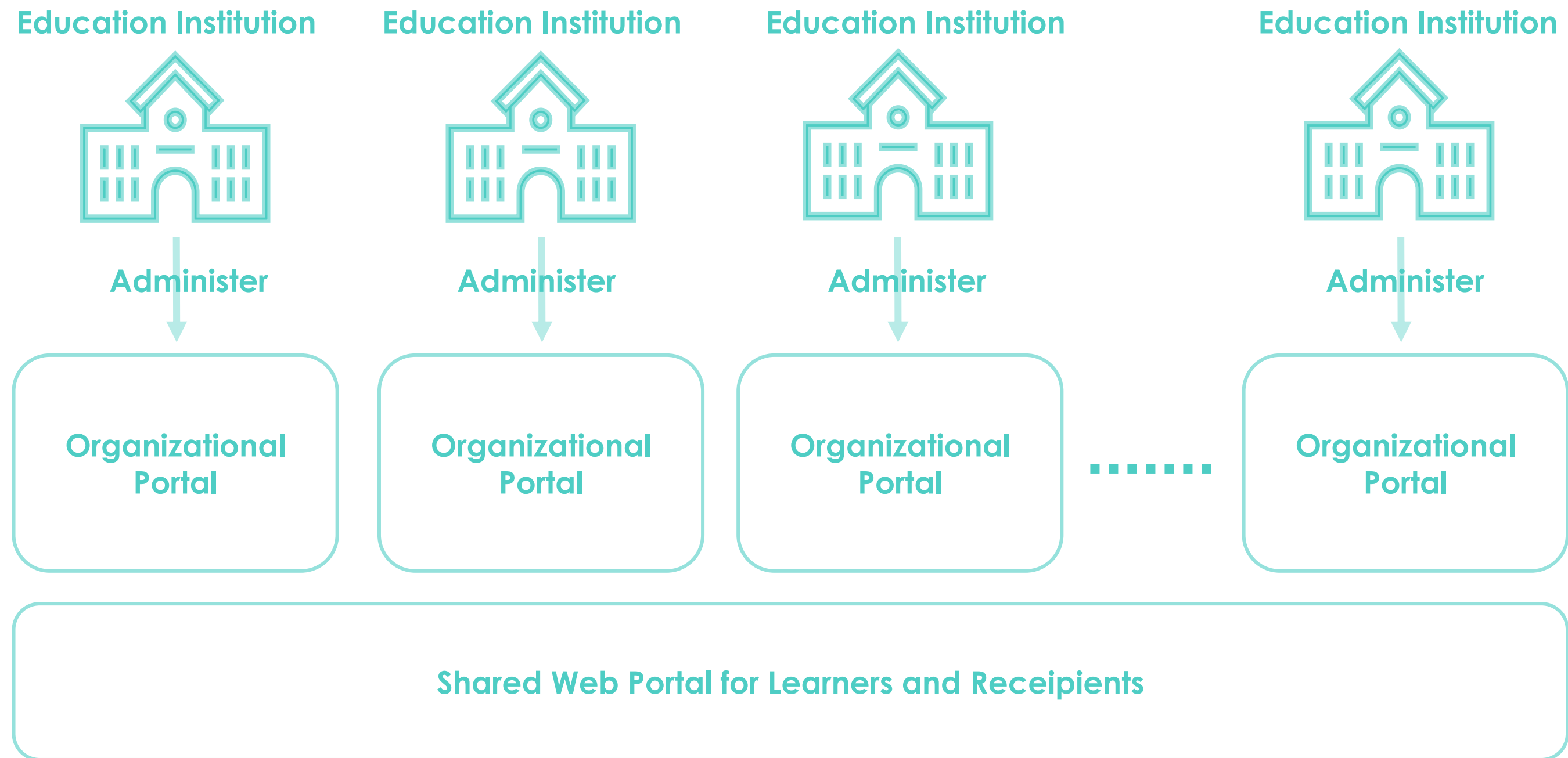
Education Institution

Central Repository is a design concept that accumulates the academic history data of all learners and graduates of universities nationwide in a central database.

Exchange Network Architecture

Central Operating Body

Education Institution

Corporates etc.

Education Institution

Switching Hub

Corporates etc.

Central Operating Body

Education Institution

Education Institution

Education Institution

Exchange Network is a design concept that connects a large number of institutions and companies with a secure network, and exchange data. It is mostly applied to international connections of multiple national central repositories.
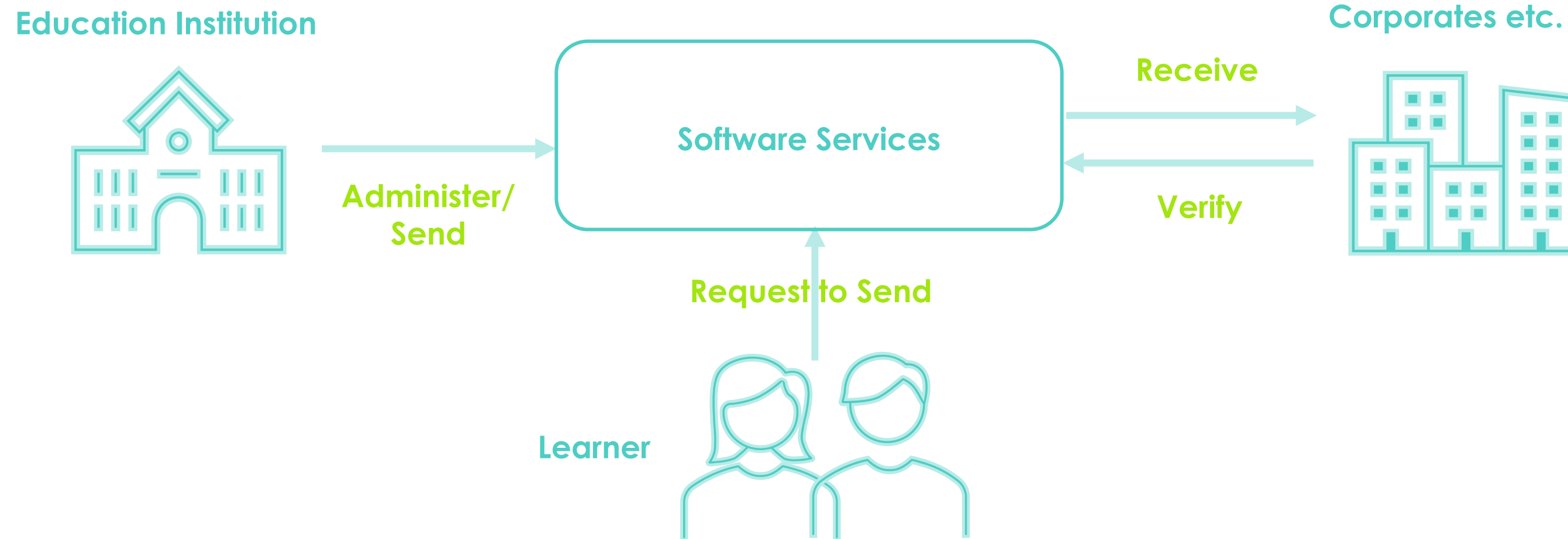
Hub & Spoke Architecture

Education Institution   **Education Institution**   **Education Institution**   **Education Institution**

Administer   Administer   Administer   Administer

| Organizational Portal | Organizational Portal | Organizational Portal | · · · · · · · | Organizational Portal |

Shared Web Portal for Learners and Receipients

Hub and Spoke is a design concept in which credential data is managed by each university, and a platform that controls the web user interface used by learners, alumni, companies, etc. is shared among universities.

Delegation UX

Education Institution → **Administer / Send** → **Software Services** → **Receive** → **Corporates etc.**
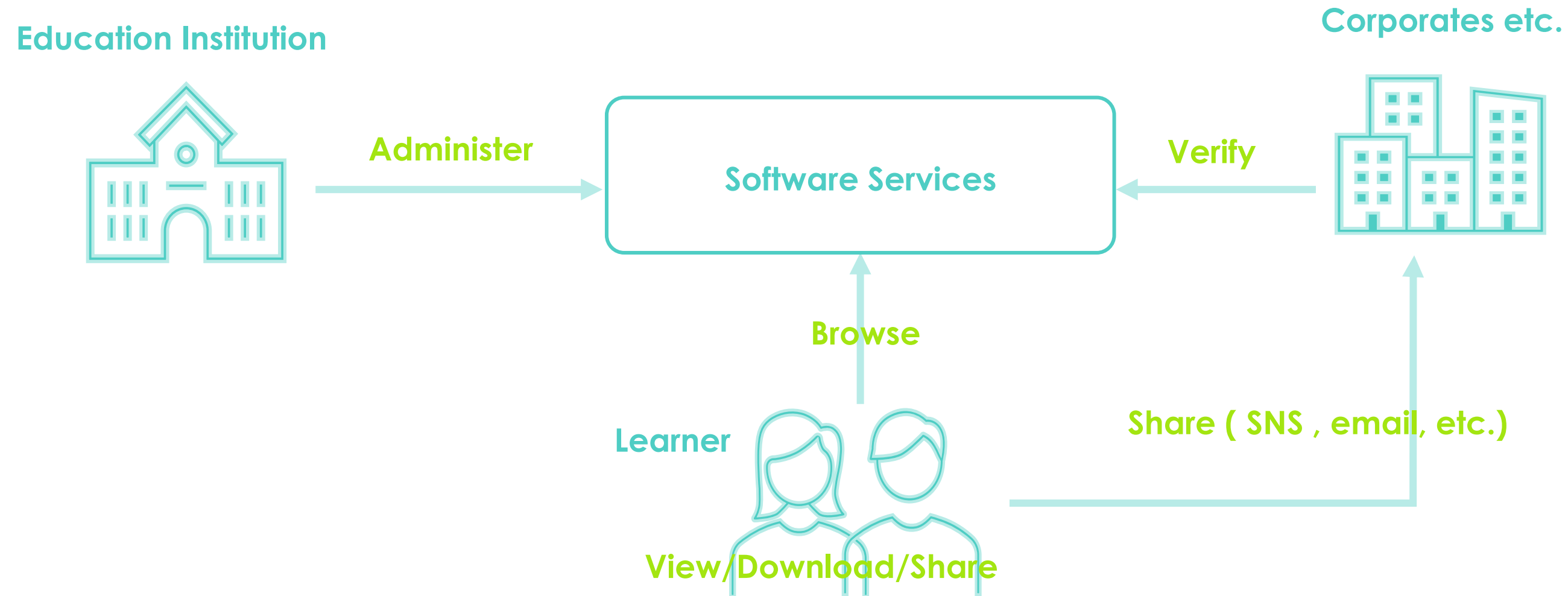
In the Delegated form of the user experience, companies/institutions granted access by an academic data manager (central operating institution or university) can access and verify the authenticity of academic proof data. Students and graduates are outside this process.

Send Request UX

Education Institution

Corporates etc.

Software Services

Receive

Verify

Administer/ Send

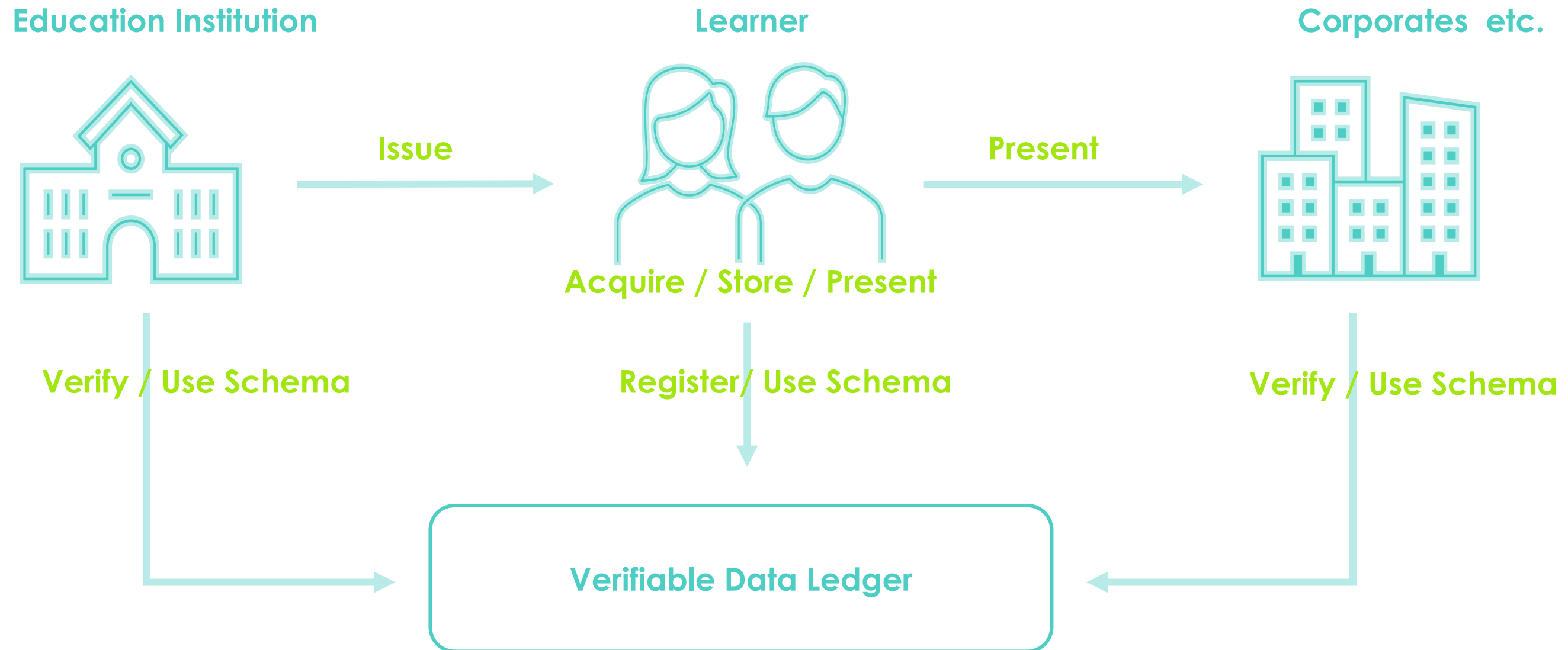**Request to Send**

Learner

In the Send-request form of the user experience, the learner data manager (central operating organization or university) sends a digital academic certificate to a hiring company etc at the request of a learner. And the company or other university that received it can access the academic record data of the relevant learner to confirm authenticity.

Self-browsing/sharing UX

Education Institution

Corporates etc.

Administer →

Software Services

← **Verify**

Browse

Learner

Share (SNS , email, etc.)

View/Download/Share

In the Self-viewing/sharing form of the user experience, learners can view their academic credentials in a browser by applying for an account (either online or offline) with an academic data manager (central operating organization or university), and can share them with anyone via SNS or email. Any company or individual who has received the credentials can confirm (verify) the authenticity of the credentials.

Self-controlled UX

Education Institution

Learner

Corporates etc.

Issue

Present

Acquire / Store / Present

Verify / Use Schema

Register/ Use Schema

Verify / Use Schema

Verifiable Data Ledger

The Self-controlled form of the user experience is mostly materialized by decentralized IDs (DIDs) and/or Verifiable Credentials Data Model (VCDM) technical standards based on the concept of Self-Sovereign Identity (SSI) of W3C , an international technical standards body for the Internet.

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Through Nation-wide Momentum

Through Nation-wide Momentum

Institute for Innovative Global Education (IIGE)

The IIGE of Kansai University launched digital credentials in 2021 and become a signatory of the GDN in September 2022. IIGE is looking forward to collaborating on student digital data portability and privacy.

International Christian University (ICU)

ICU launched Japan's first digital academic credential for short courses in September 2021 on Digitary platform and expanded it to digital degrees, transcripts and other documents in April 2022. ICU will continue committing to interoperability and learner-centricity of credentials in collaboration with the international higher education community.

Shibaura Institute of Technology (SIT)

SIT launched Japan's first digital credentials for degree and transcripts in October 2021 on Digitary platform and launched digital badges for short courses in April 2022. SIT will continue innovating its digital credentials toward Verifiable Credentials (VC) and other cutting-edge technology in the future.

Chiba Institute of Technology (CIT)

CIT's Center for Radical Transformation (CRT), jointly with PitPa, launched NFT and VC-compliant digital credentials in August 2022, very first in Japan. And CIT and Pitpa are planning to expand the user community outside their campus over other higher education institutions in Japan.

Open Badge Network (OBN)

Open Badge Network (OBN) has been leading Open Badge deployment in Japan. IIGE of Kansai University, Yokohama National University, Hosei University and about 50 universities have already been members of OBN in addition to leading private companies like Asahi Kasei and major certification organizations, which has now become 150 members in total.

The Open University of Japan (OUJ)

The OUJ launched digital badge in 2021 on the LMS of Digital Knowledge, an EdTech IT firm. The OUJ and Digital Knowledge have been leading EdTech solutions including Open Badges.

Kinki University and 64 NTT West users

Nippon Telegraph and Telephone (NTT) West Corp. launched PKI-embed PDF digital credentials service for Kinki University and a couple of other universities in early half of this year and will go live for 5 more institutions within this fiscal year. The plan is to roll it out for more than half of their 64 existing higher education institutional customers within 2-3 years.

150 universities of Uchida Yoko users

Uchida Yoko is launching a new version of its SIS service in October 2022. Uchida Yoko has integrated the Digitary CORE service as a trial with the aim to offer this as an optional service to their existing users of 150 universities.

Continue developing

Thank you!

Any questions?

Graphic Design thepopp.com