The 2nd Workshop on Open Science Data Promotion
@ Kyoto University

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Expectation for Open Innovation

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Hitachi Consulting
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1. The significance of the promotion of Open Science

Human Dreams.
Make IT Real.

1. The significance of the promotion of Open Science

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From “5th Interim Report of the Science and Technology Basic Plan”

[Achievement]

- ◆ High researchers and quality papers is increasing on the basic plan over four periods in 20 years.
- ◆ There was a remarkable achievement such as many the Nobel Prize, Blue LED and iPS cells etc.

[Agenda]

- ✓ In this decade the growth of research and development funds to stagnation, research site that was started young are exhausted by a variety of "wall" such as between generations, organizations and border.
- ✓ Basic research force has also been sluggish , standing position of our country in the world is a subordinated trend as a whole .
- ✓ It is necessary to correspond with a sense of crisis and sense of speed.

1. The significance of the promotion of Open Science

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[Trends in the world]

Infrastructure development of open science as a trend of the world (human & things) has been promoted steadily, there is a need also urgent corresponding infrastructure in Japan (Japan is one or two lap behind.)

[Future initiatives]

- In order to win the international competition, everyone promote open science regardless of the public, private sectors, age or sex.
- Standing in the global perspective, we aims to achieve the following two points;
  - ✓ **Acquisition of the "Food" of growth for the future**
  - ✓ **Country suitable for most innovation in the world**

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[Point of view as a company]

- ✓ We expect that corporate activity becomes more active as open science progressed by coordinated with many stake folders.
- ✓ We realize that open innovation will accelerate more and more by collaboration between companies in the future.

For the promotion of open science (open innovation),
What we can do as a company ?

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2. Involvement into the Open Science as a company

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2. Involvement into the Open Science as a company

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[Hitachi's efforts to academic fields]

- ✓ Construction of the J-STAGE and JaLC system.
- ✓ Building a conceptual model of information cooperation for the vocabulary database
- ✓ Infrastructure Construction of RDF cooperation with other databases in the human gene integrated search system
- ✓ Construction and operation of Academic Data Center
- ✓ The promotion of open innovation and social innovation as a business side of the open science

[Hitachi's efforts to Open Innovation]

- ✓ We position as important activities of technology management university-industry cooperation.
- ✓ We contribute to the improvement and human resource development of Japan's competitiveness and technology
- ✓ We are engaged in positive efforts to promote the cooperation with universities in a wide range of fields such as R&D, new areas creativity and human resources education.

2. Involvement into the Open Science as a company

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[Hitachi's efforts example to Open Innovation]

- ✓ Hitachi joined hands with Hokkaido University in the development of compact and low-cost proton beam cancer treatment system "PROBEAT-RT".
  Hitachi acquired a manufacturing and marketing approval of medical equipment based on the Pharmaceutical Affairs Law.

- ✓ Database products that Hitachi has developed, based on joint research with Institute of Industrial Science, the University of Tokyo, was the world's first registered in maximum class (100TB) in industry-standard benchmarks of database system "TPC-H".

2. Involvement into the Open Science as a company

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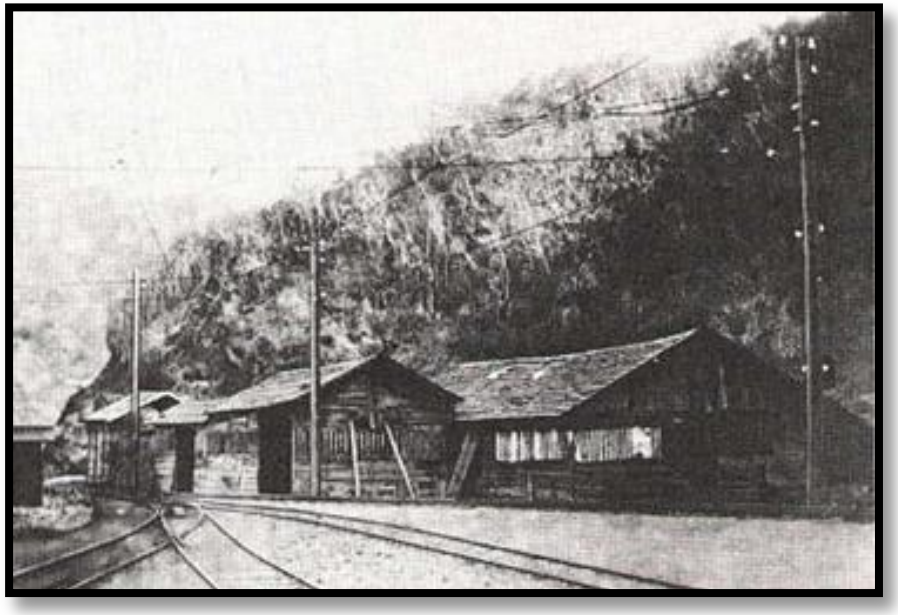
Hitachi's efforts to Social Innovation: Headwaters is in its inception !

- Founded in 1910 as a machine repair shop at Kuhara Mining Company in Hitachi City, Ibaraki Prefecture, Japan (Incorporated in 1920)
- Hitachi founding spirit: Harmony(和), Sincerity(誠), Pioneering spirit(開拓者精神)
- Corporate credo: Contribute to society through the development of superior, original technology and products

Founder Namihei Odaira



Original repair shop in Ibaraki (1910)

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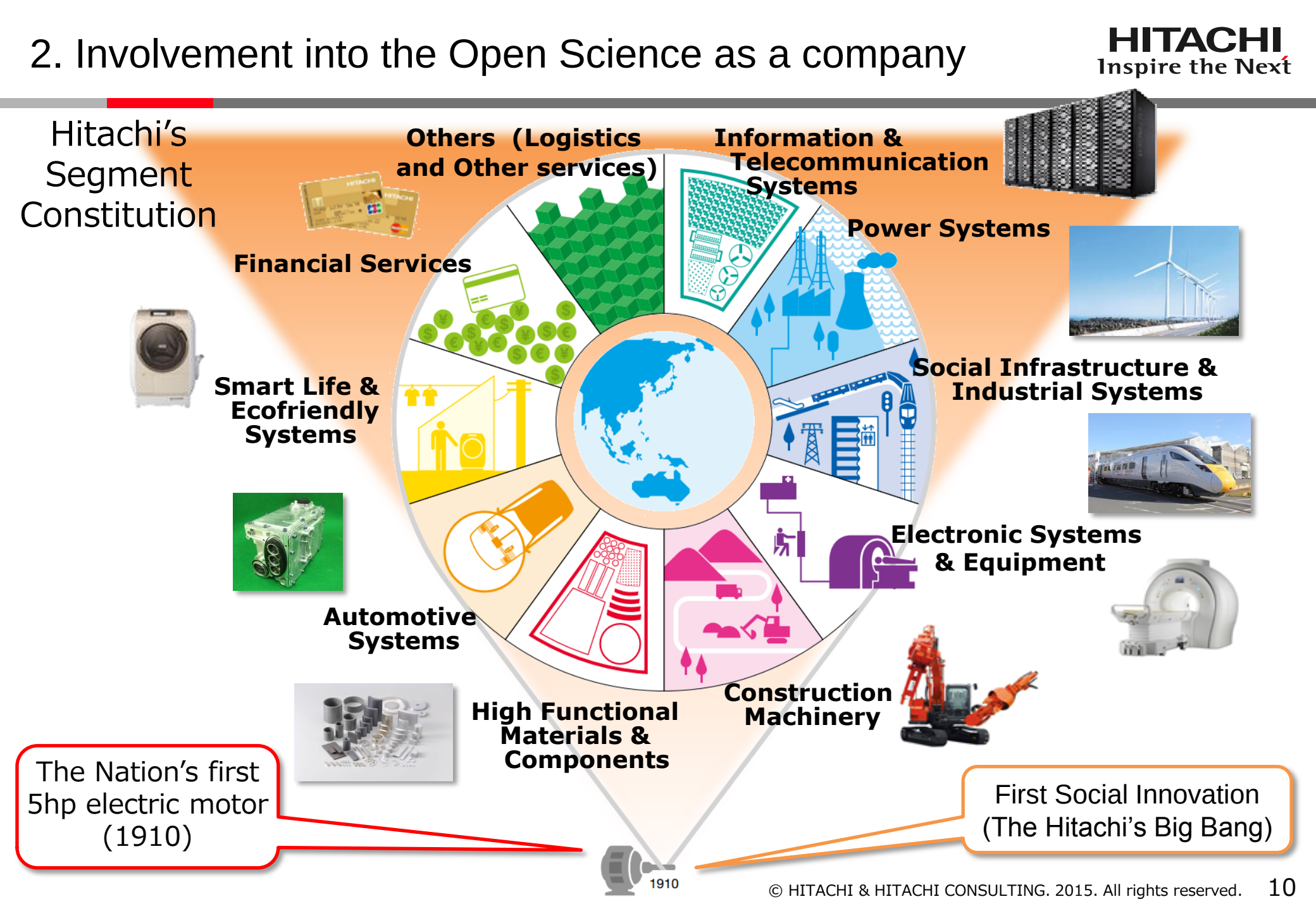
Hitachi's Segment Constitution



The Nation's first 5hp electric motor (1910)

1910

First Social Innovation (The Hitachi's Big Bang)

2. Involvement into the Open Science as a company

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Expansion of Social Innovation Business 【Mgt. & R&D】

Promote management and R&D close to customers (front-line)

Global Management

- Expand the Social Innovation Business by making management decisions in each region based on the market and customer needs
- Start with 4 regions: North America, Europe, China and Asia

North America	Energy, Telecommunications, Healthcare, Connected Car, Security
EMEA CIS*	Manufacturing・SCM, Energy, Healthcare
China	Building・Urban, Finance, Healthcare, Smart Logistics
Asia Pacific	Healthcare, Finance, Developer, Conglomerate

Global R&D

- Reorganized R&D structure
- Established the Global Center for Social Innovation to share issues and develop with customers (Tokyo, North America, China, Europe)

Global Center for Social Innovation

Create solution services by collaborating with global customers

Center for Technology Innovation

Create innovative products and technology

Center for Exploratory Research

Explore opportunities to drive innovation to the next level

* EMEA・CIS: Europe, the Middle East and Africa, Commonwealth of Independent States

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Expansion of Social Innovation Business 【Cyber-PoC】

Accelerate Global Collaborative Creation in the field of Social Infrastructure Business

- Innovate social infrastructure with customers.
- Projects ongoing with customers in the field of manufacturing, natural resources, financial services, and biotechnology.

Customers / Market

Collaborative Creation with Customers and Establish Business

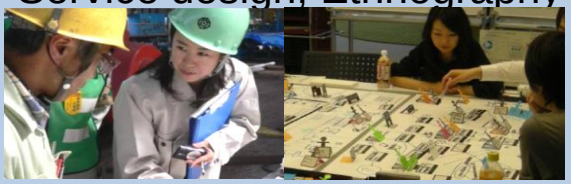
(1) Share Vision & Issues

(2) Develop Prototype, Demonstrate & Validate (Cyber-PoC)

(3) Solutions Services

Technological Methodologies for Collaborative Creation with Customers

Service design, Ethnography



Promote as “One Hitachi”

Platforms, Systems, Products, Technologies

Business Expansion

* Cyber-PoC: Cyber-Proof-of-Concept: Visualization simulator which supports customers’ business creation

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3. Expectation for the promotion of Open Science

Human Dreams.
Make IT Real.

3. Expectation for the promotion of Open Science

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- As a company , we'd like to know what kind of data sets to use of business. That we can do is as follows:
  - ✓ Think together about what kind of dataset does have the potential of business.
  - ✓ Develop the Open Science infrastructure for promoting research and study (research support tool and analysis tool included)
- A key of the success is how to design the network exteriority, which has property of increasing in advantage convenience as the user increases, for Open Science.
- It's necessary that Open Science Infra has Open Development Environment as Xcode(iOS) and Android in order to realize the network exteriority earlier (Improvement of the environment to create application with everyone).
- The most serious concern: How much does a government prepare money for the above development?
  (Europe has developed an Open Science infra with each country cooperates. :Horizon2020)

※ Citing from Executive Foresight Online "Open Innovation, The condition of success"
http://www.hitachi.co.jp/products/foresight/strategy/s001/index.html

3. Expectation for the promotion of Open Science

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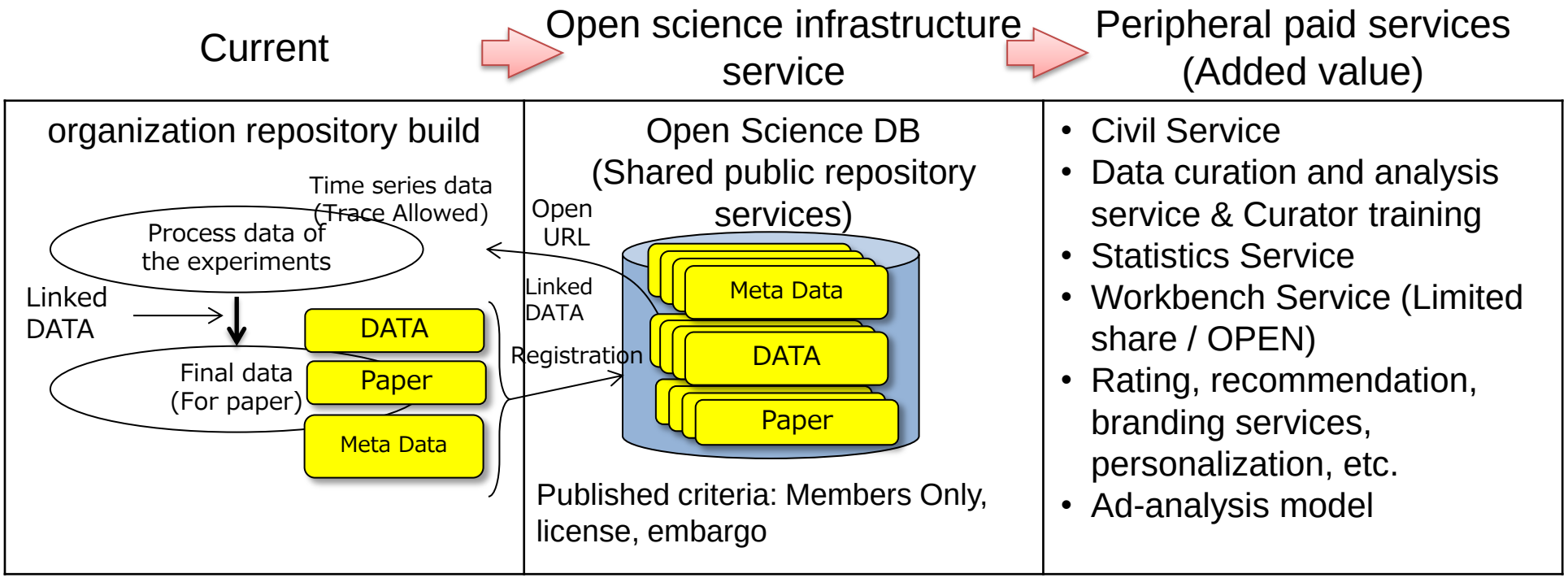
- Path to Open Science success
  1. Construction by the use of national policy budget (for each research field)
  2. Construction by the use of national policy budget (common infrastructure)
  3. National policy budget of subsidies, investment by private funds (companies), and operated by the Foundation (donation included)
- Business Service Image



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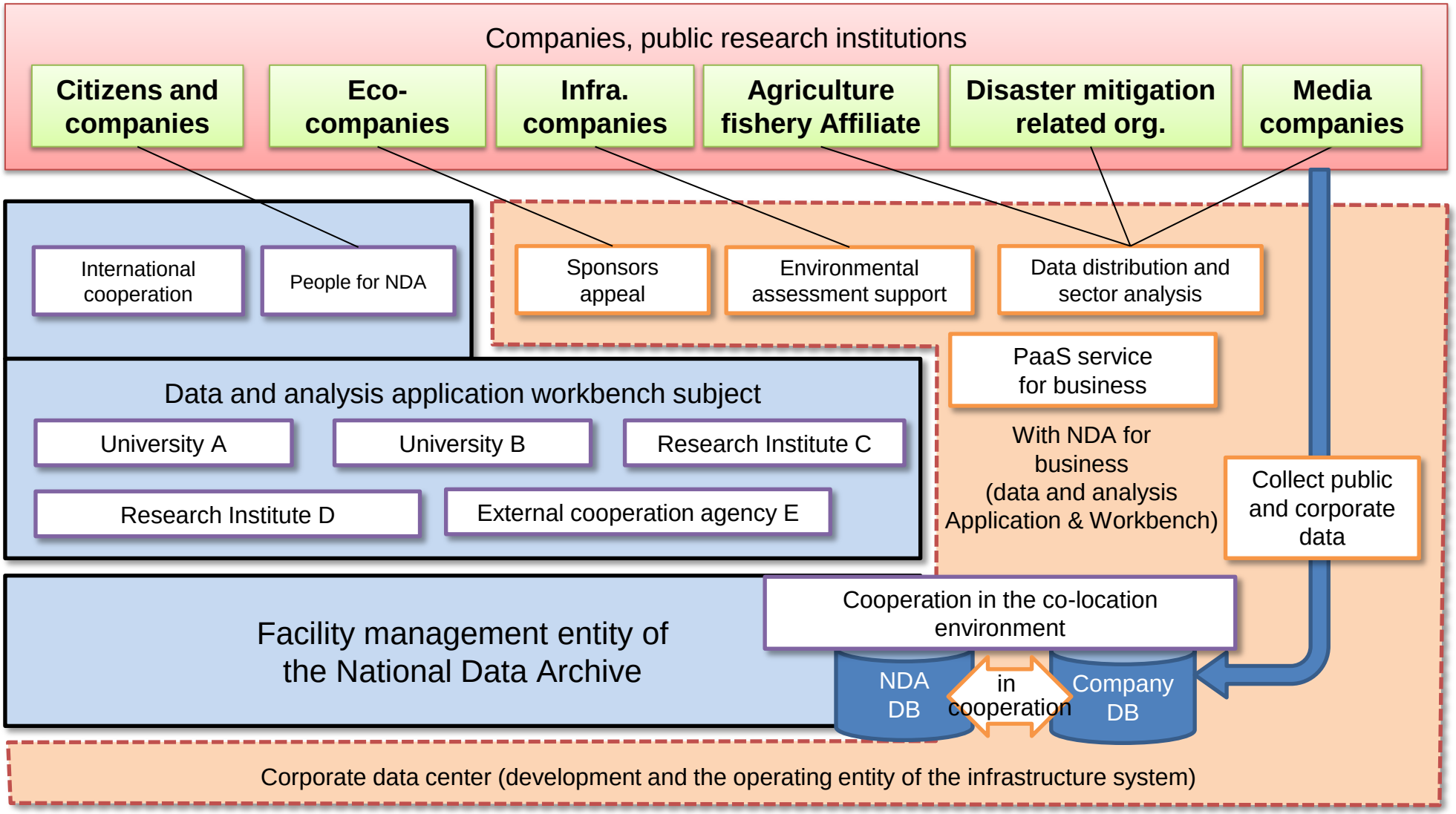
Example of Image of the state of the private participation in long practical use on National Data Archive



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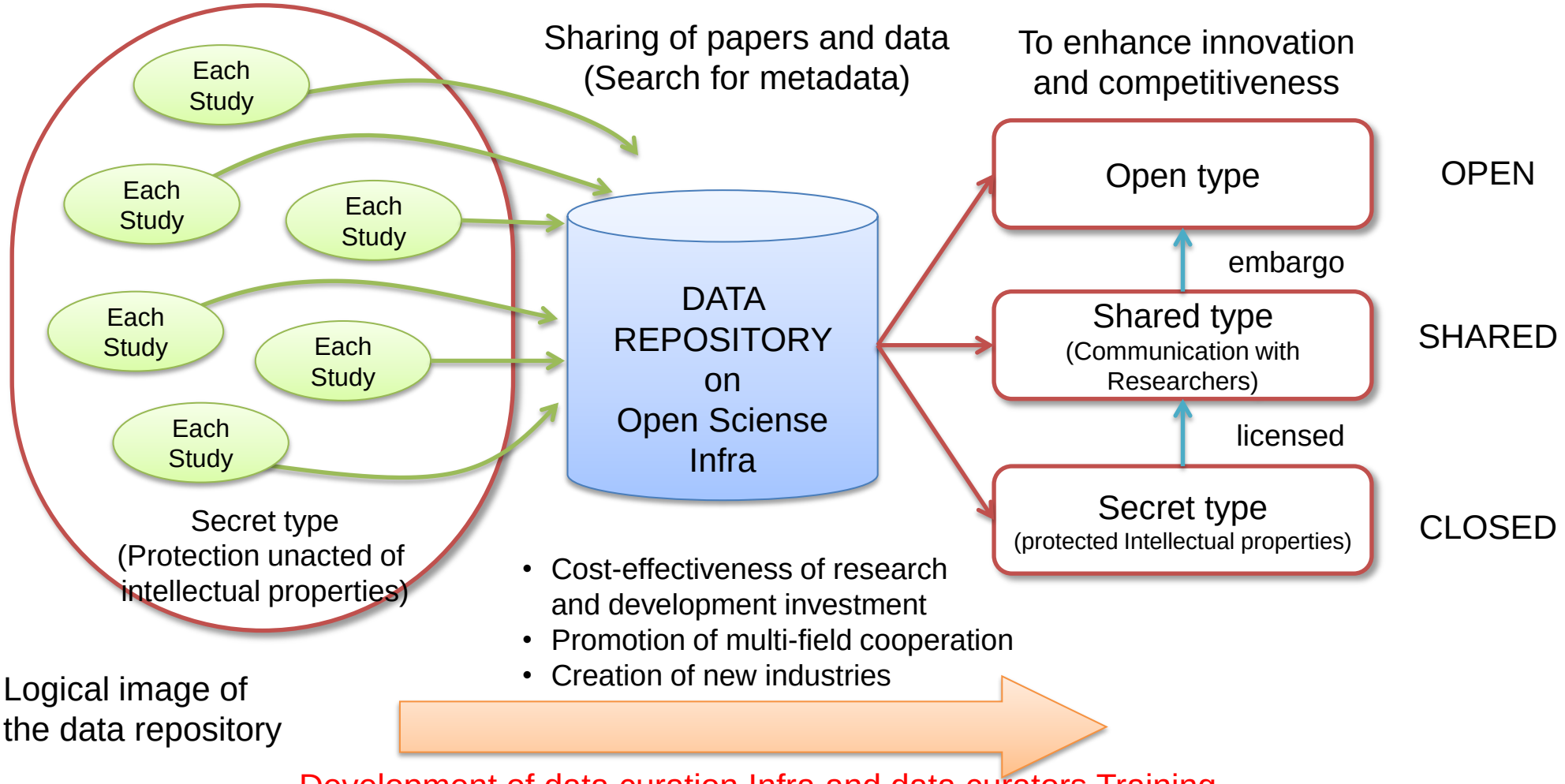
About opening methods of data in Open Science.



Development of data curation Infra and data curators Training
(Example, including intellectual property protection process)

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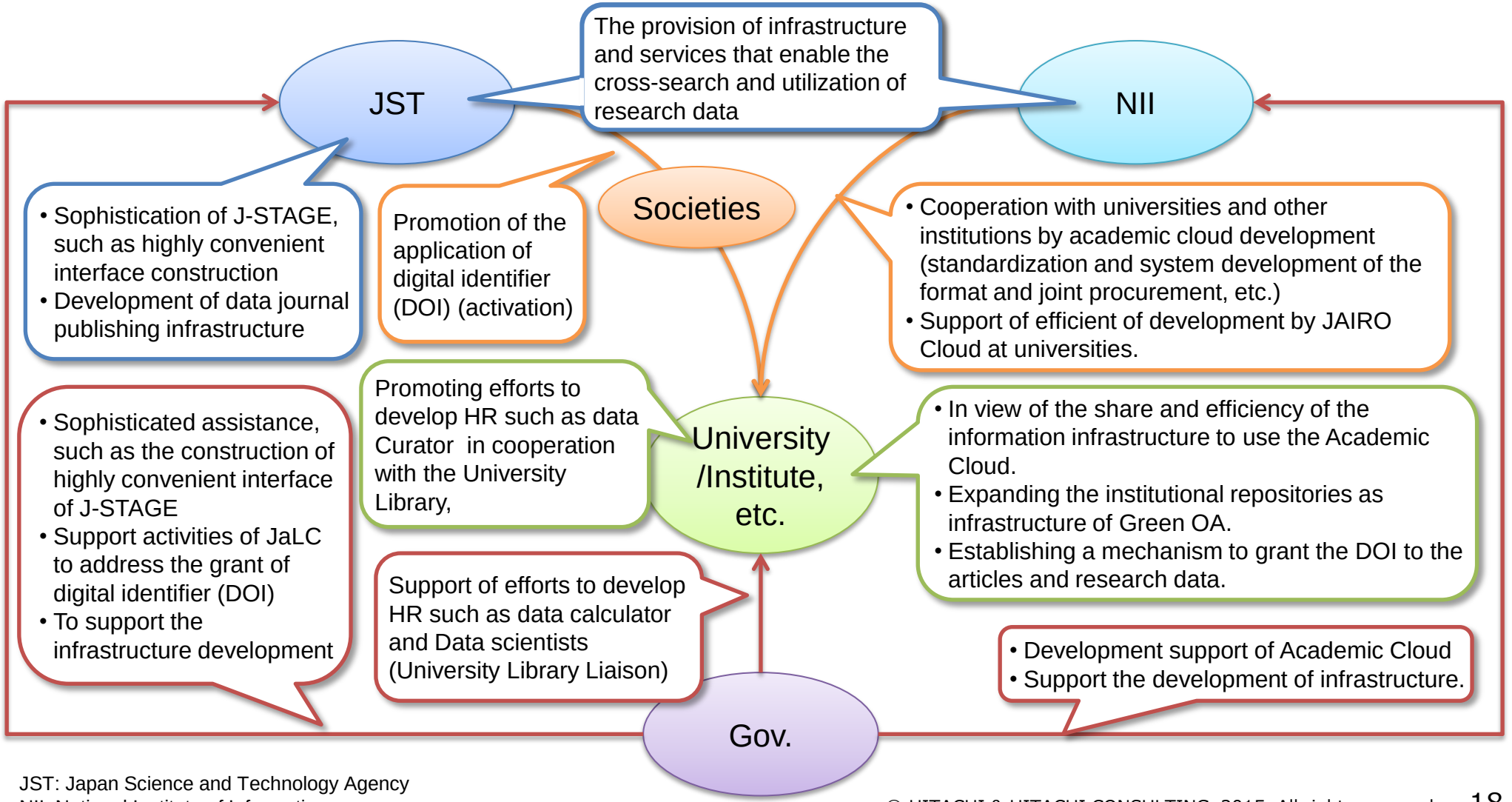
Related images of concrete measures to tackle the government's support and each institution （From Science and Technology Council Academic Subcommittee article）



JST: Japan Science and Technology Agency
NII: National Institute of Informatics

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4. The thoughts toward the promotion of Open Science

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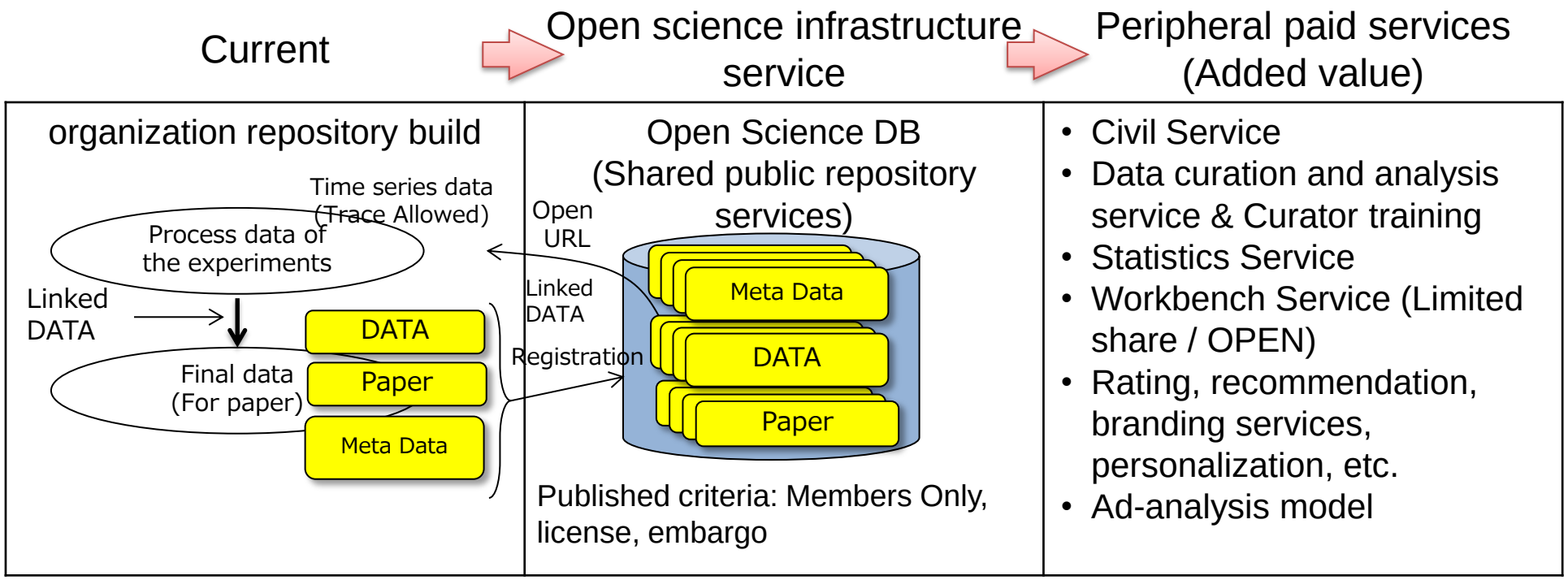
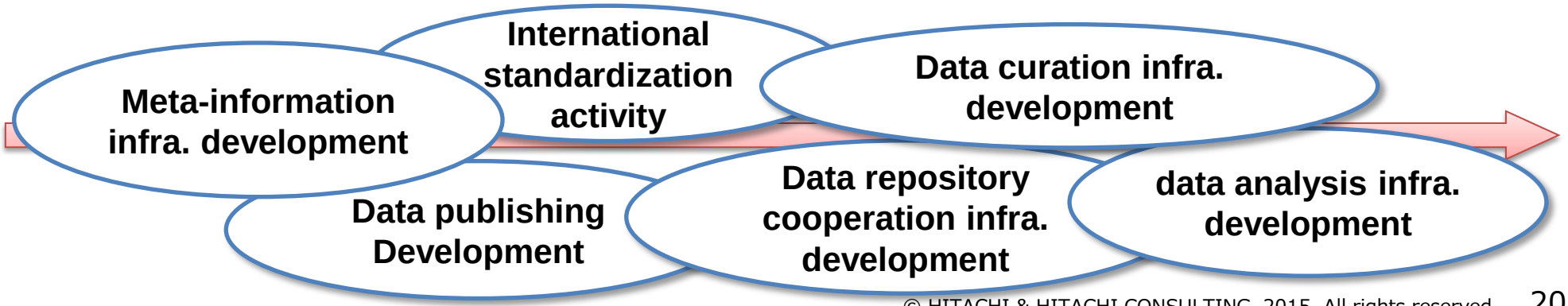
■ Business Service Image





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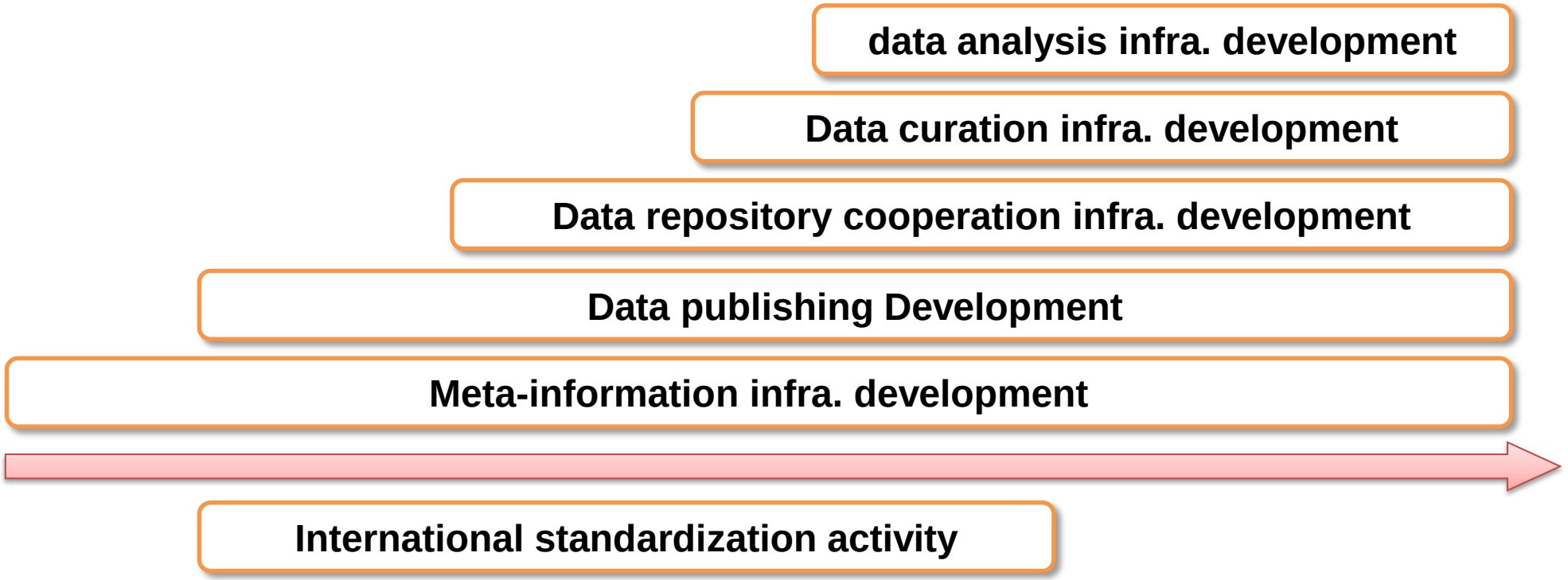
What is important development points for the promotion of Open Science
(Suspect content)

- Simple registration methods (Ensure the convenience of the subscribers)
- Power search methods (Ensure the convenience of the user)
- DATA Publishing (Effective use of data)
- Training of data curator



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[Data Catalog site publishing business one-stop application]

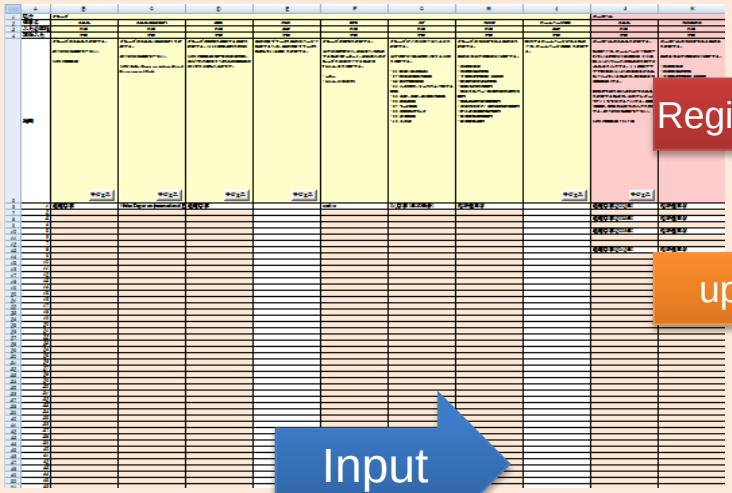
On the Excel of content metadata (title, format, etc.) of the "extraction, input, registration, update business" to perform a one-stop

Gov., ministries and agencies of the web page

Contents (350)

抽出

Application



Input

Registration

update

DATA Catalogue site

Open data publishing business

1.metadata extraction	2. metadata input	3.metadata registration	4.metadata update
Working hours 1/40	Working hours 1/Several tens of thousand	Run Time 1/Several hundred	Working hours 1/250

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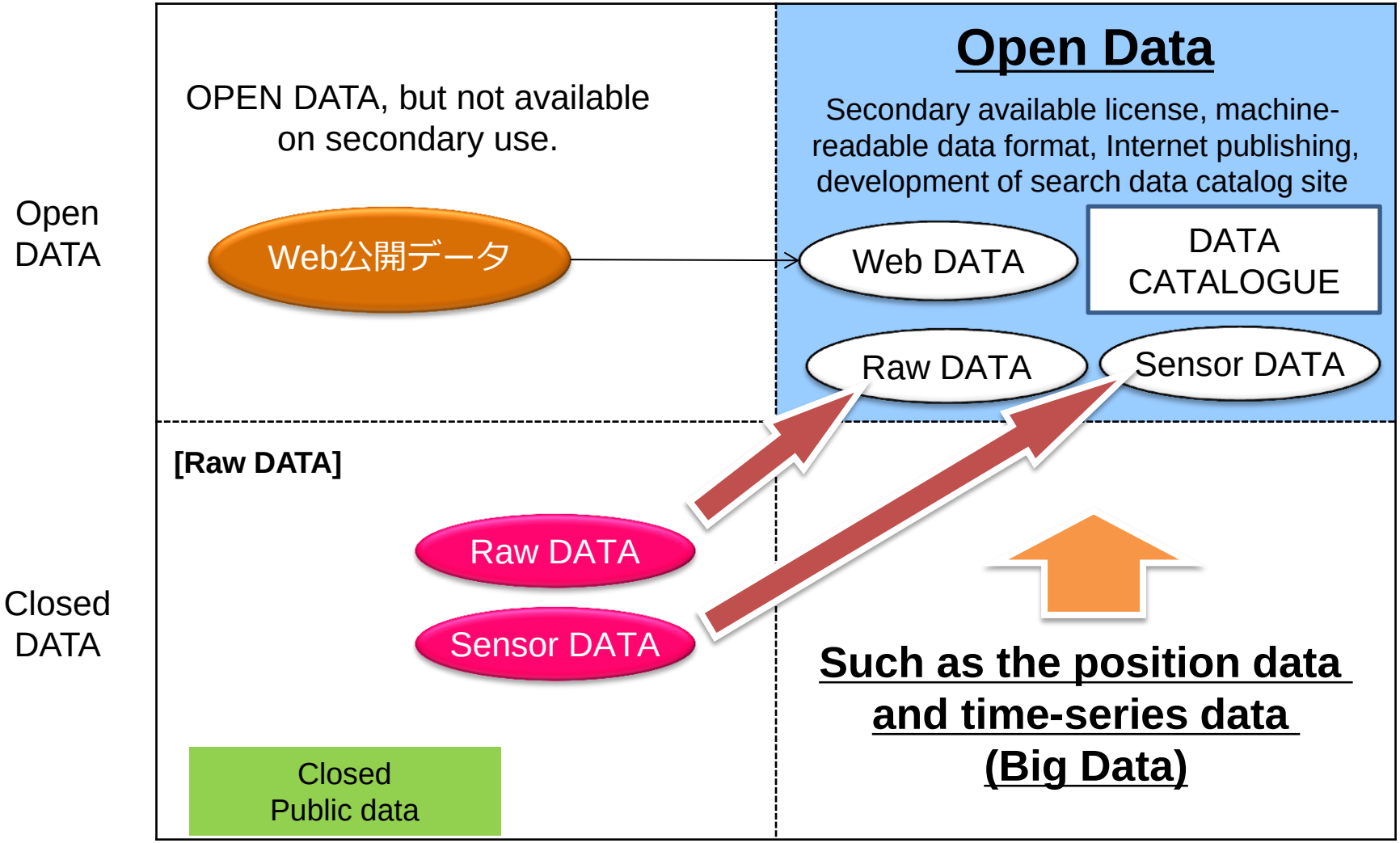
From the open data of public to the Open Science



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The listed as high-value data (emphasis area data) as a data set, the following 14 data category

#	DATA CATEGORY	Example of DATASET
1	Corporation	Corporate registration, commercial registration
2	Crime and Justice	Crime statistics, in accordance with the safety data
3	Earth Observation	Weather, weather, agriculture, forestry, fishing, hunting
4	Education	School List, school performance, digital skills
5	Energy and Environment	Pollution level, energy consumption
6	Financial and contract	Expenditure transactions, rental agreement, tender notice other
7	Geographical space	Topographic map, zip code, national map, local map
8	Global development	Assistance, food safety, mining, land
9	Accountability, democracy of government	Government contacts, election results, law, payroll, entertainment and gifts
10	health	Prescription data, performance data
11	Science and Research	Genome data, research and educational activities, the experimental results
12	statistics	National statistics, census surveys, infrastructure, property, skills
13	welfare	Housing, health insurance, unemployment benefits
14	Transportation and infrastructure	Time data, the access point of public transport, broadband penetration rate

In addition, priority areas that the Japanese government is a tackle with priority:

1. white paper
2. disaster prevention and mitigation data
3. geospatial data
4. people moving data
5. budget and balance sheet, and procurement data

Source ： UK Cabinet Office 「Open Data Charter Technical annex」 (2013/6/18)
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207458/Open_Data_Charter_Annex_FINAL_13_June_2013.pdf

4. The thoughts toward the promotion of Open Science

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Case example of business model of weather insurance services using Open Data in US

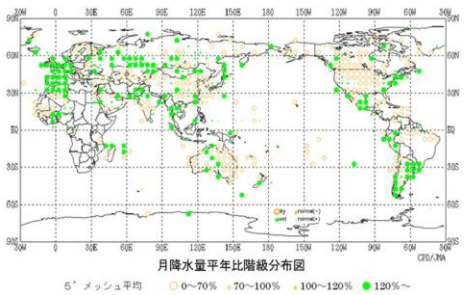
task When farmers suffer crop damage in bad weather, only crop insurance of US government compensation is not enough .

Solution It provides weather insurance services on the basis on weather data and soil data to compensate for the damage caused by abnormal weather

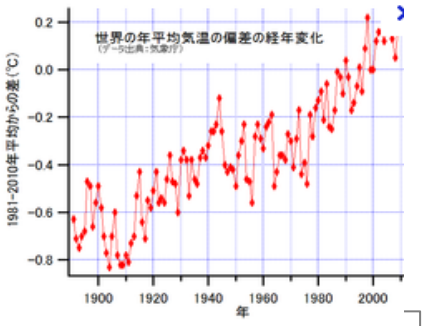
current status Global warming & bad weather give lots of damage to the crop . However , security amount of crop insurance of the US government is insufficient

crop insurance of the US Gov.

Crop yield depends on the weather



Bad weather increases in the influence of global warming



Source: Japan Meteorological Agency
http://www.jma.go.jp/jma/kishou/jma-magazine/0212/

future Provide weather insurance services by analyzing the abnormal weather risk based on the open data of meteorological and environmental relationships (Insurance to compensate for the revenue on the yield falls). Contractor obtained an income compensation and agricultural support information.

Predict probability of the harvest damage occurrence of each region and crop

Data acquisition

National Weather Service stations (NWS)
- Meteorological data

The United States Department of Agriculture
- Yield DATA of the past 60 years
- Soil DATA

Analysis

Appropriate insurance fees and recommended agricultural products

Provide a weather insurance service products

Goal
- The users obtain a sufficient crop damage compensation by paying the appropriate fee.
- The users can refer to meteorological & soil data necessary for farming.

4. The thoughts toward the promotion of Open Science

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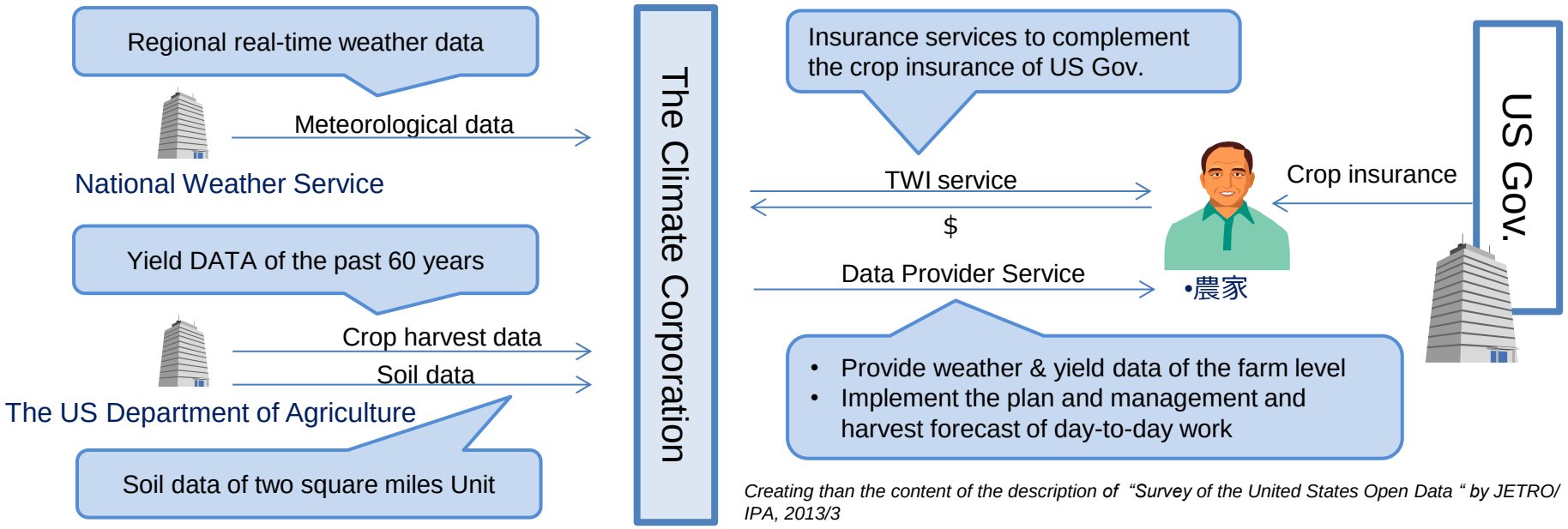
Case example of weather insurance services using Open Data in US

Overview

- The Climate Corporation, Inc. provides a weather insurance program “Total Weather Insurance (TWI)” to protect farmers from crop damage caused by bad weather.
  http://www.climate.com/growers/total-weather-insurance/

Business Model of The Climate Corporation in US.



Creating than the content of the description of “Survey of the United States Open Data “ by JETRO/ IPA, 2013/3

■Remarks

1. This model is introduced as one of the open data use case on *“Survey of the United States Open Data “ by JETRO/ IPA, 2013/3*
2. This weather insurance service has a role to complement the guarantee of crop insurance provided by the US government.
3. In this service, in order to calculate the weather insurance charges, meteorological data, and utilizing the open data, such as soil and crop data, and provides the data to subscribers.

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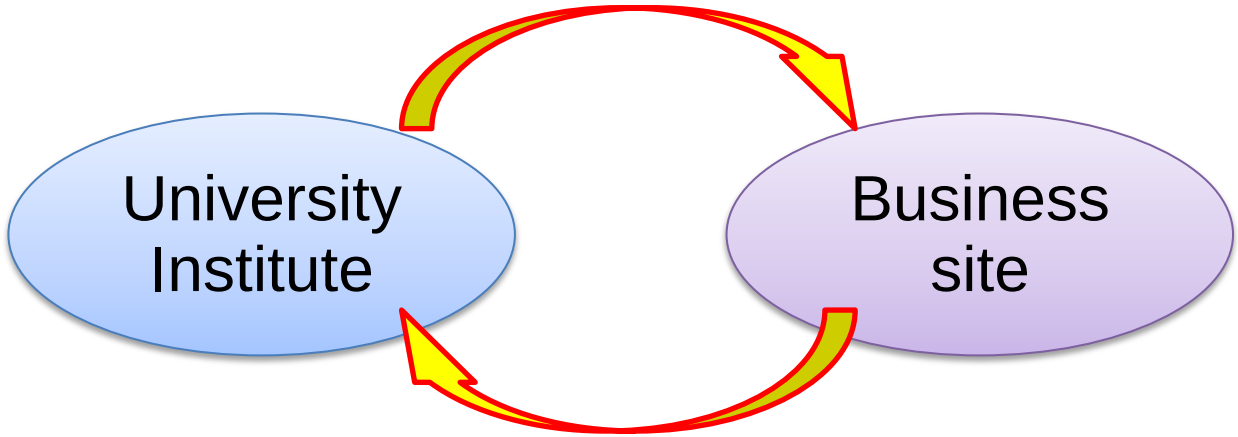
5. Summary

Human Dreams.
Make IT Real.

5. Summary

- We, as a member of the corporate, expect that the better society can be realized in progress in the application of a variety of research results in the future.
- Hitachi also want to contribute more and more to open science promotion.
- It is necessary to collaborate among company and university to promote of Open Science Technology. To create and progress the new technology, not only the knowledge of the institute side, the knowledge of the enterprise side is also required.



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Thank you for your attention.

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