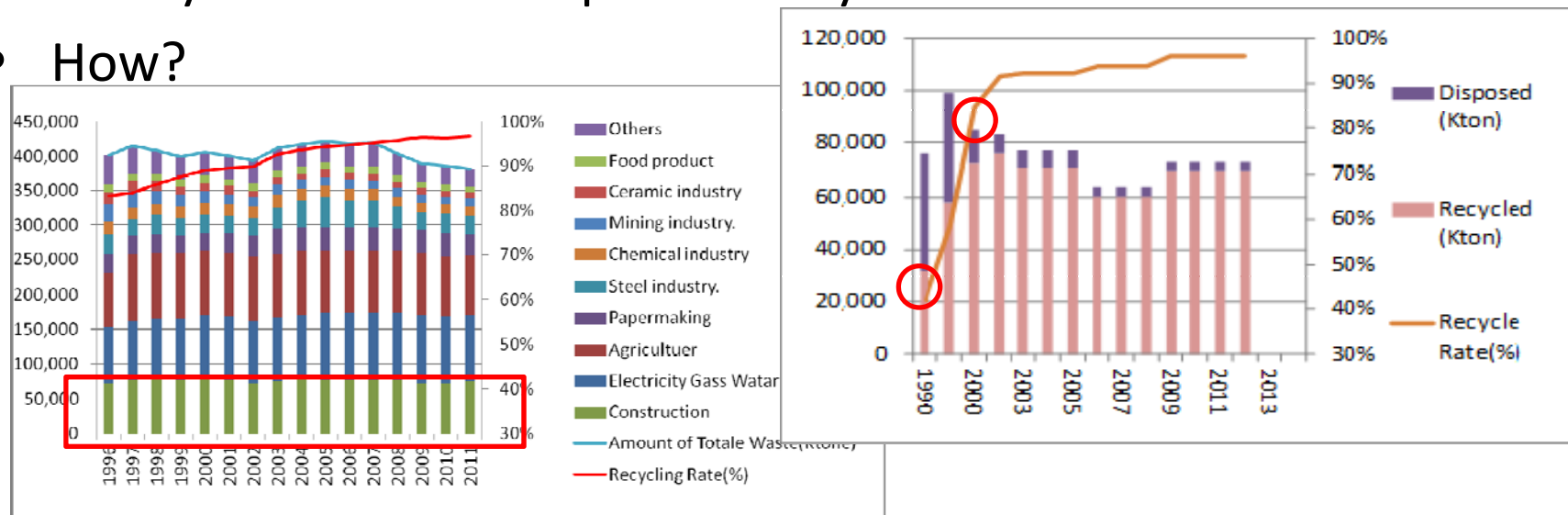


# Opening data exchange for sharing information of C&D(Construction & Demolition) waste recycling

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ICCCBE 2016 OSAKA

# Year 2000

- JAPAN's recycling policies underwent a dramatic change.
- Construction sector has been in the TOP3 amount for waste.
- Its recycling rate was 40% in the 1990s.
- Reached 80% in 2000 and hit 90% in the next year
- Slowly increased until present day
- How?

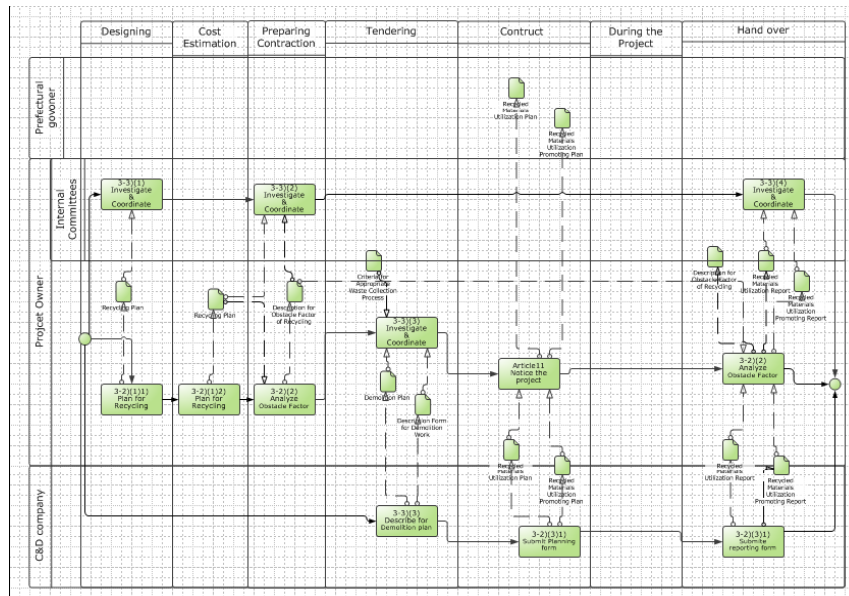


# Great efforts by People

- People involved in recycling policies
- Including ....
  - pubic construction project owners
  - construction & demolition companies
  - recycling plants.
- A lot of works must've been done.

# Information Management

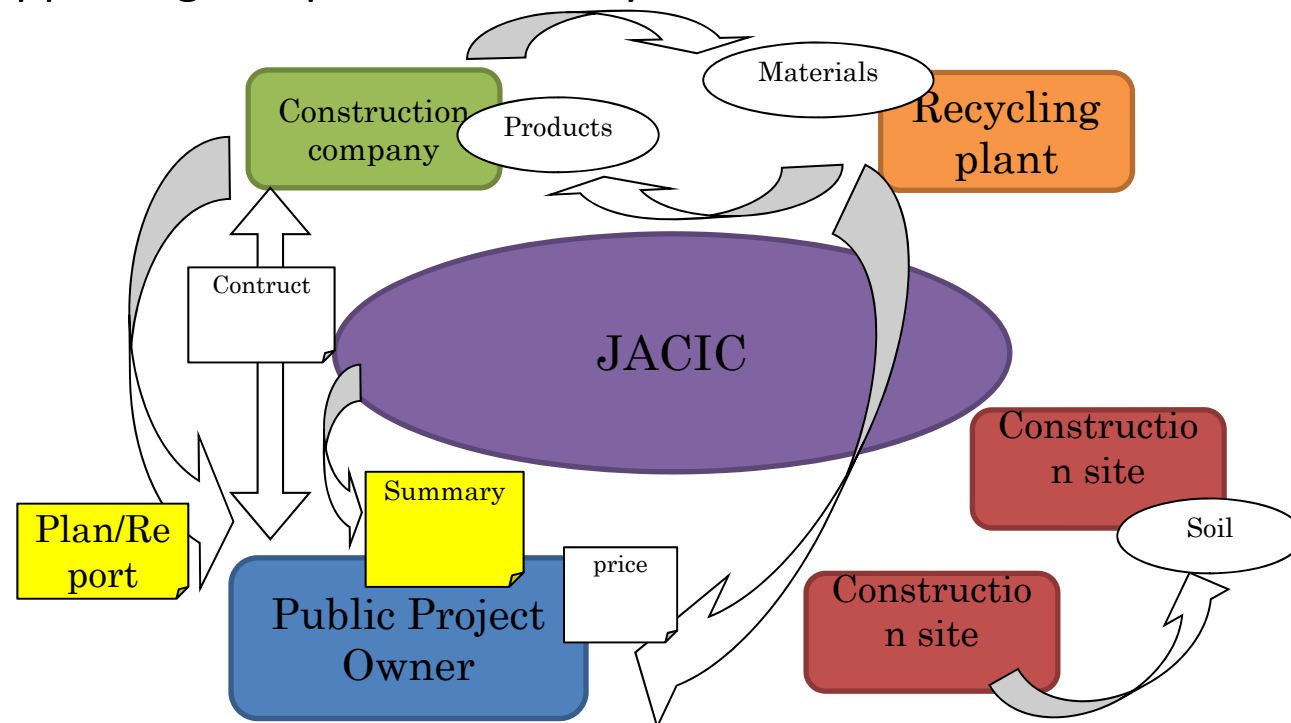
- One of important practices.
- MLIT (Ministry of Land, Infrastructure, Transport and Tourism) conducts ...  
GUIDELINES, for the procedure of recycling plan and report.  
CENSUS, nation wide survey ,for every 4 years.
- We(JACIC) 've been helping their Information Management.



year	CENSUS
1990 (H2)	1 <sup>st</sup>
1995 (H7)	2 <sup>nd</sup>
2000 (H12)	3 <sup>rd</sup>
2005 (H17)	4 <sup>th</sup>
2008 (H20)	5 <sup>th</sup>
2012 (H24)	6 <sup>th</sup>

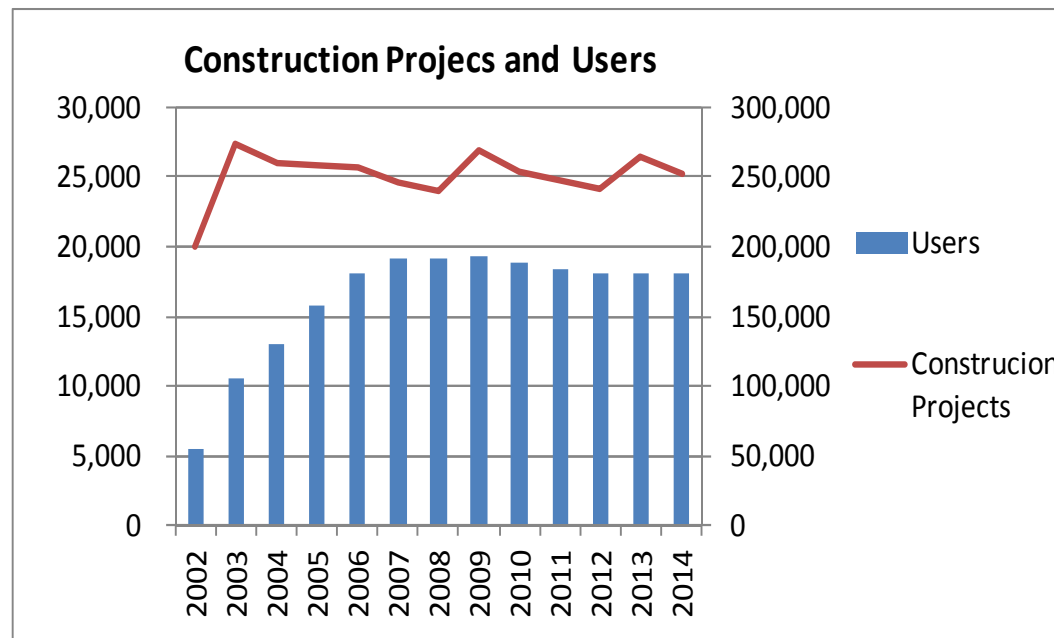
# Our service

- Construction companies are required to submit Plan/Report for recycling .
- Public project owners can summarize whole recycling data.
- Also shearing price of recycling fees ,S/D of soil among construction sites.
- We've been supporting this process for 15 years.
- However .....



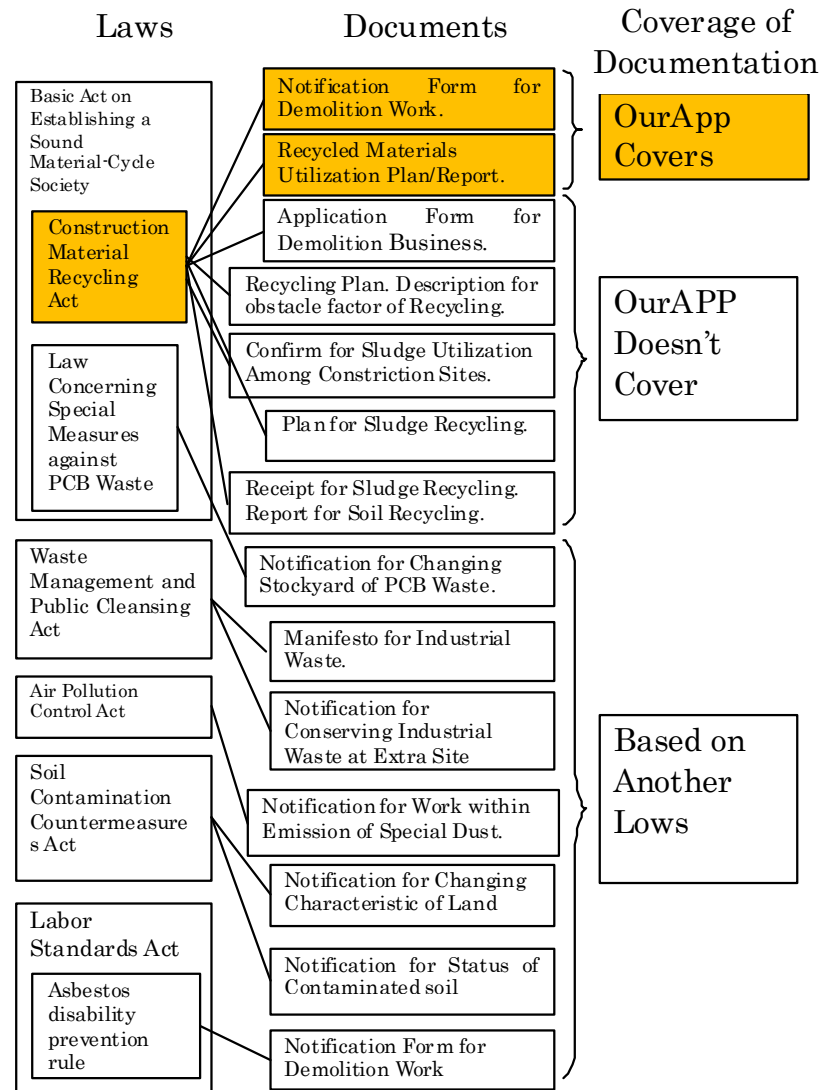
# Not enough widespread support

- Users remain stable or decreased.
- We haven't yet to cover every aspects of People involved.
- Especially local governments, municipals.
- And private construction project owners.
- Why?



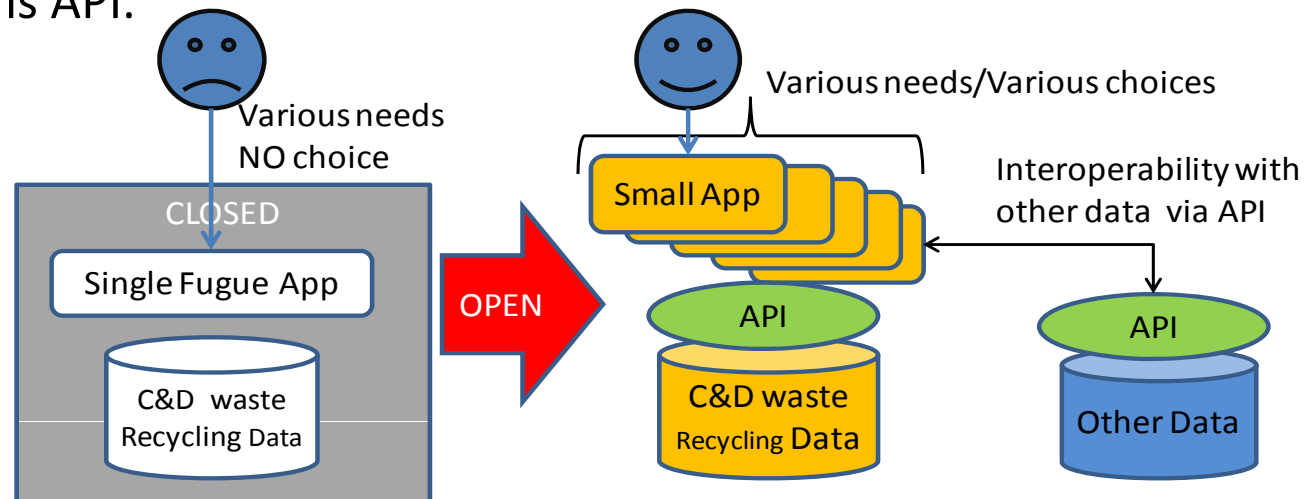
# Limited coverage

- We only cover a small part of `Construction Material Recycling Act`.
- People must've been engaged in other kind of law policies.
- Our App can't have been adequate for their tasks.
- Should be addressed and solved



# Open data strategy

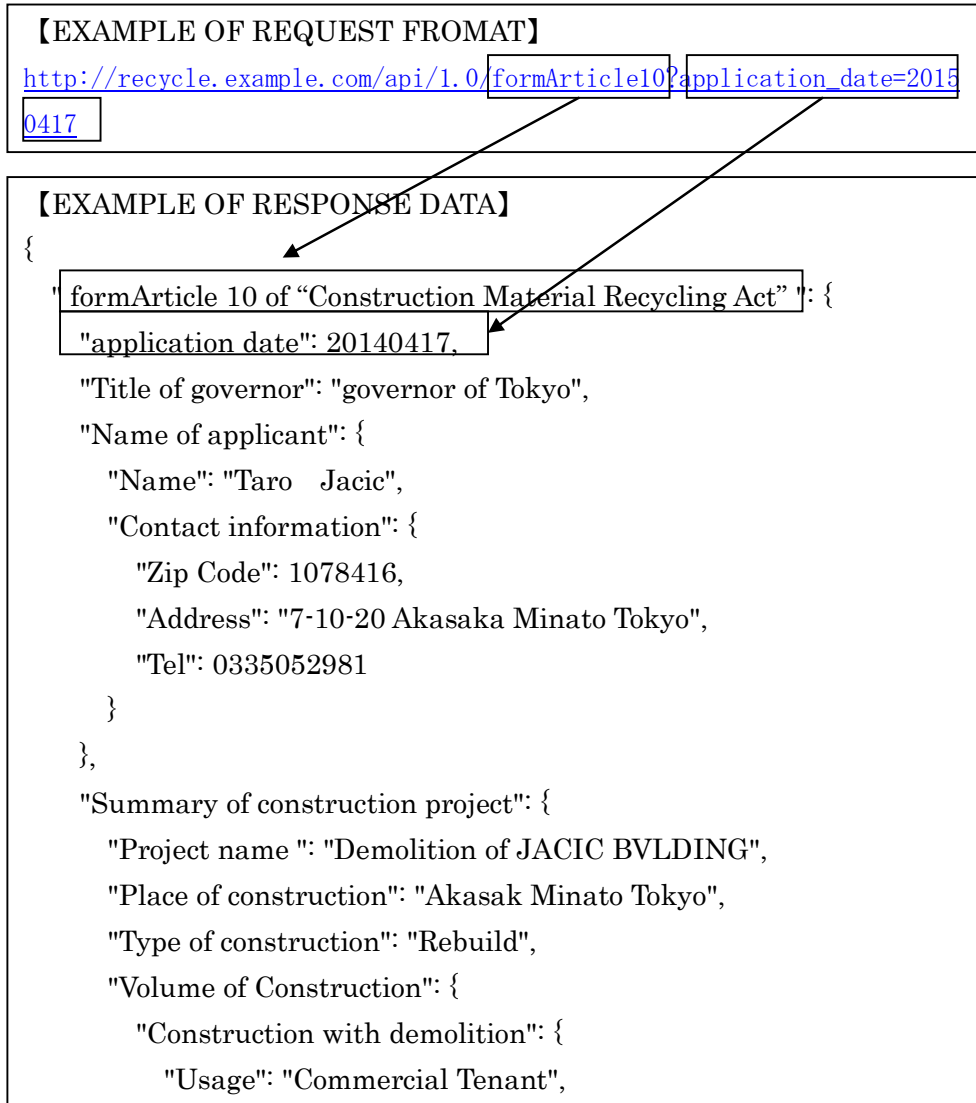
- C&D waste recycling data is closed by our App.
- End-users have NO choice but to use exclusively via our App.
- They have various recycling duties, further needs for other procedure.
- Open data strategy
  - Enables 3<sup>rd</sup> parties can access to C&D waste recycling data.
  - These 3<sup>rd</sup> parties can develop new App for various needs quickly.
- Key technology is API.





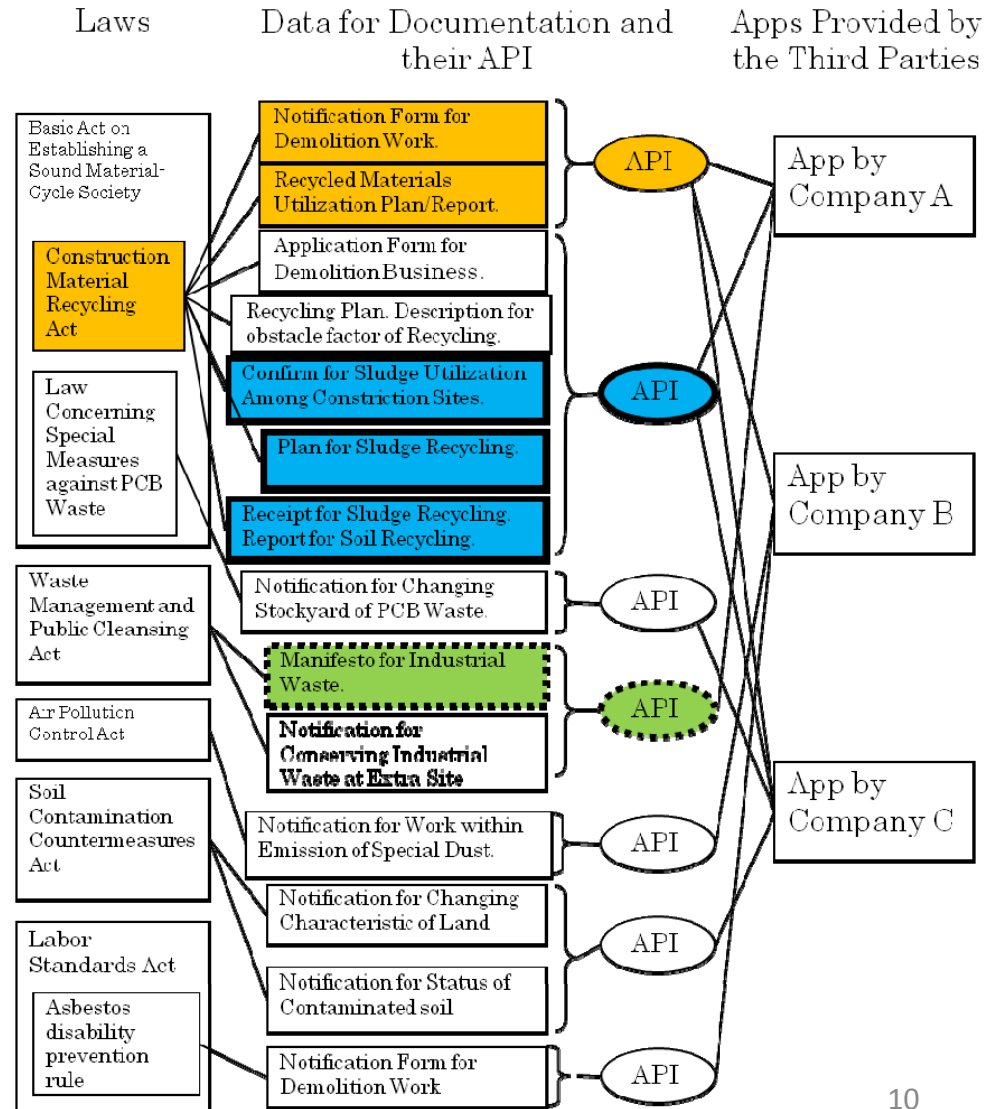
# Outline of API

- Web service API is a web based remote computing mechanism.
- Using HTTP request and response, like netsurfing with web browser.
- Internally, App calls API as HTTP request to fetch data.
- Then, App receives data as HTTP response.



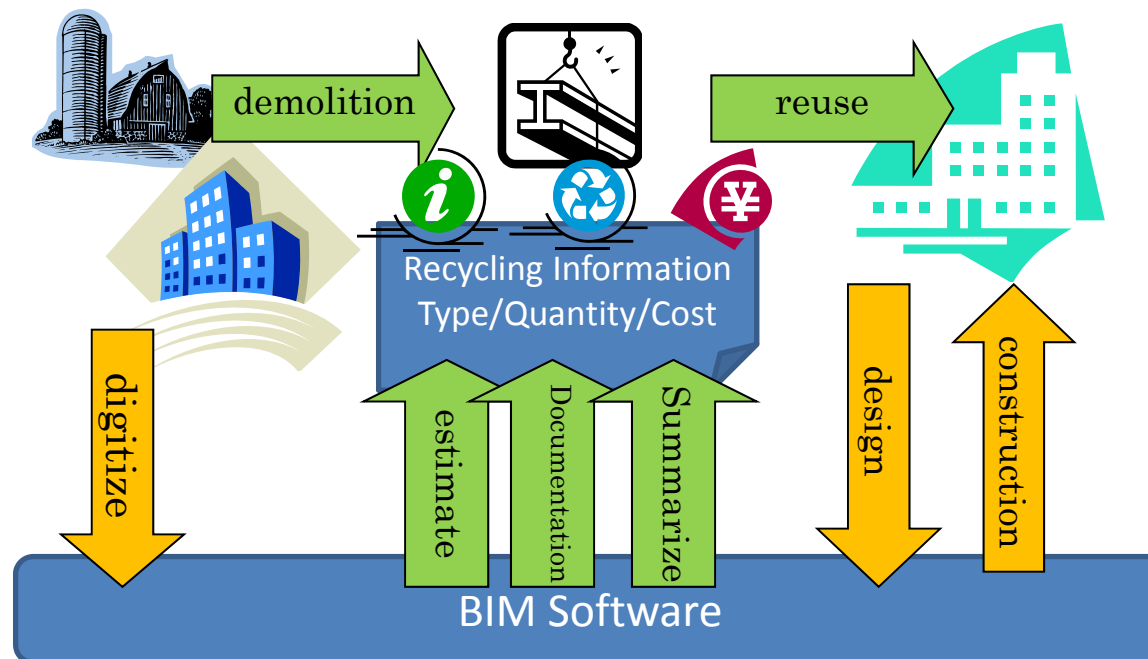
# Over the wall of policies

- 3<sup>rd</sup> parties can develop new Apps by using API for their customer's job.
- Not only using Our API but also using other policy based APIs.
- New services will be launched little by little.
- All documentations or data analysis tasks will be supported by combining data from these APIs.



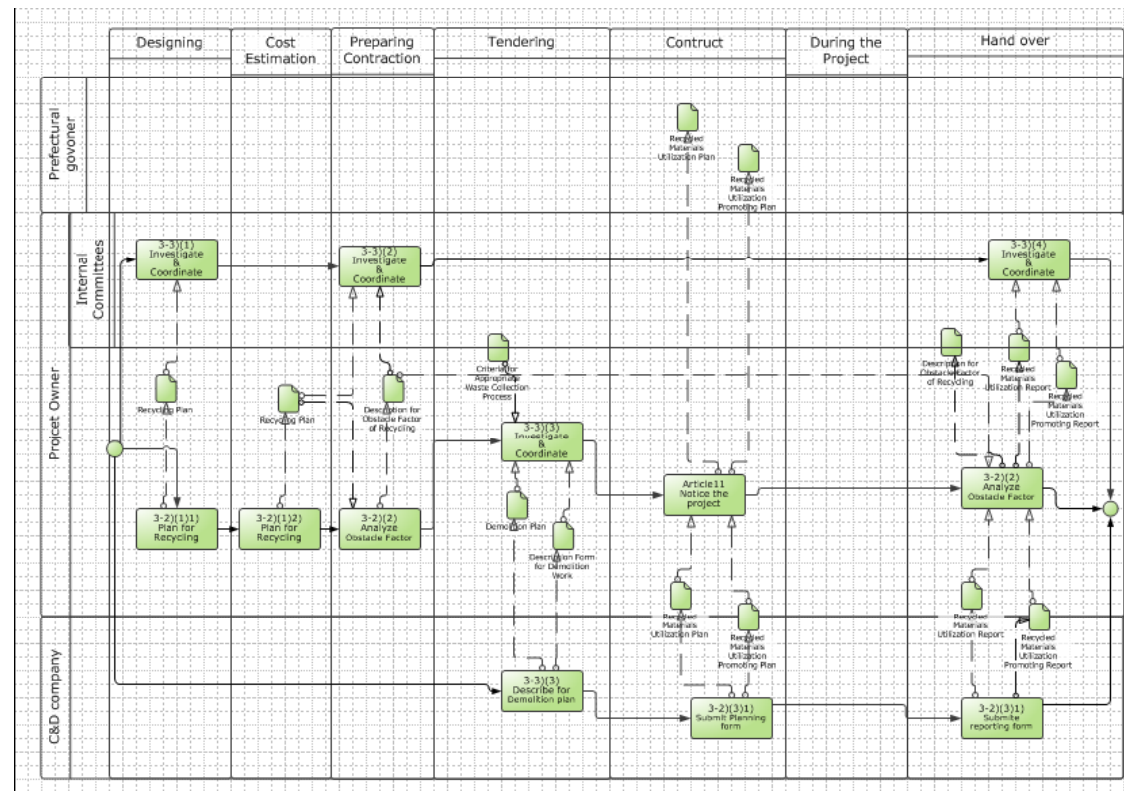
# BIM for C&D waste recycling

- BIM is 3D-CAD based software set for whole life cycle of building
- BIM is progressively being used in the world currently.
- For C&D waste recycling, most important information are Volume&Weight.
- BIM software have data items to describe V&W for each materials.
- BIM software is easy to quantify C&D waste.



# Trial for BIM 1

- IDM(Information Delivery Manual) configuration
- Using BPMN(Business process Modeling Notation).
- Describes work-flow for planning and reporting of C&D waste recycling.
- Interpreted from GUIDELINES for C&D waste recycling.

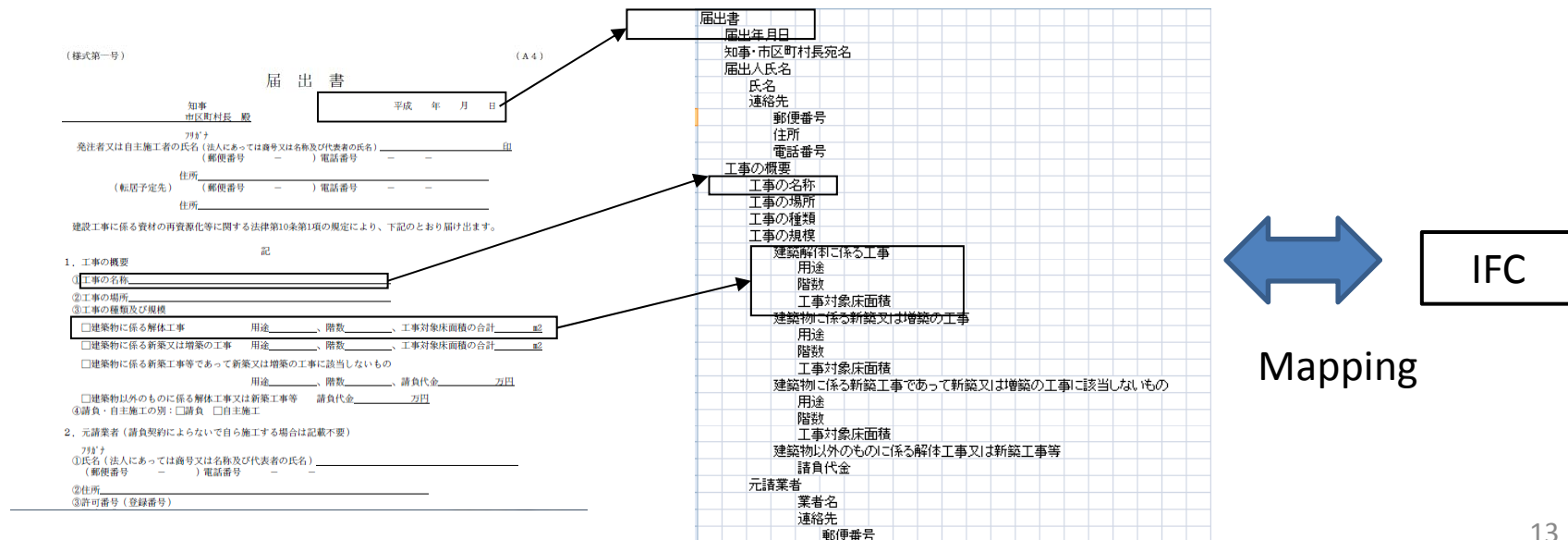


# Trail for BIM 2

- MVD (Model View Definition) configuration.
- Used existing Registration sheet for a demolition project.
- Extracted data items from the sheet.
- Trying to map between extracted data items and IFC schema

Registration sheet for demolition

Extract Data items

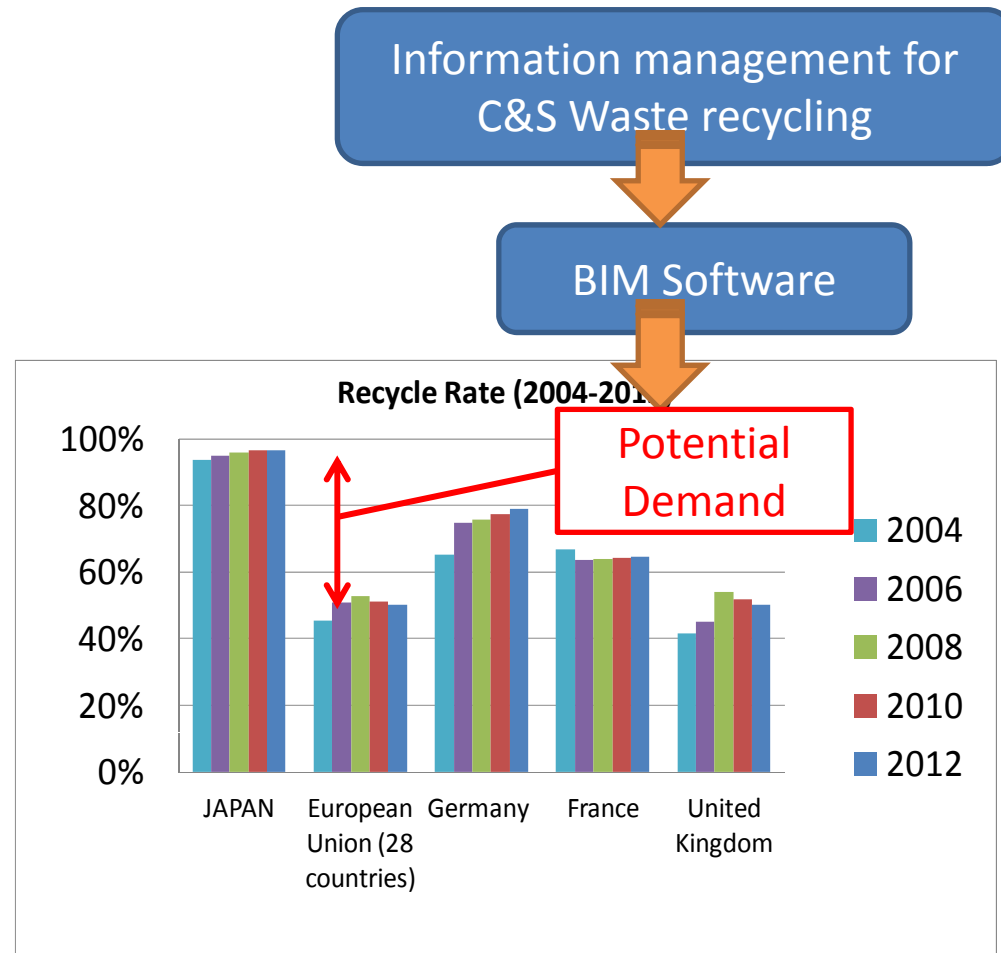


# Summary

Development Process for BIM	Task	Practice /Comprehension of the Process
IDM	Drawing Work-flow	Finished one example. Complexity to use current NOTATION
	Finding Exchange Requirement	Skipped Requirement was clear by existing Sheet
MVD	Extracting Data Items	Finished one example Generalization/Specialization , Aggregation should be done
	Mapping with IFC	Still been researched/Analyzed Analyzing possibility of Quantity-Set in IFC4
Software Implementation	-	-
Software Certification	-	-

# For global contribution

- JAPAN's recycling rate is higher than EU's leading countries.
- According to statistical data from MOE (Ministry of the Environment Government of Japan) and Eurostat.
- Only JAPAN's kept 90% recycling rate for 8 years.
- JAPAN's information management for C&D waste recycling will bring great benefit through BIM.



Thank you