



Analyzing Japanese Law History through Modeling Multi-versioned Entity

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Law as a Blueprint of Society

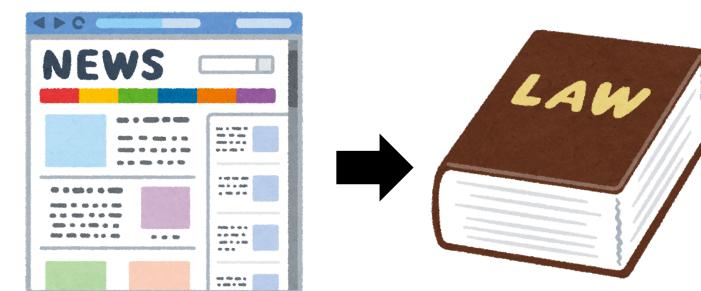
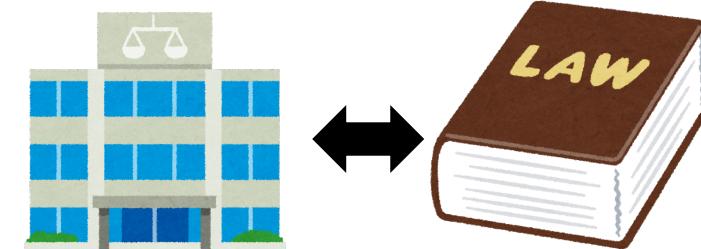
- (Statute or written) Laws describe regulations for whom in a society.
 - e.g., Copyright Act, Public Assistance Act
- Laws have been changed as the society changed.
- From the law's viewpoint, we can
 - observe the status of the society,
 - historical changes of the status over decades, etc.

An analytical demand on Japanese Law History

- Period: 1889 – 1945
 - 1889: Adopt European style law system.
 - 1945: Proclamation Defining Terms for Japanese Surrender.
- Acts and “*emergency*” imperial orders had same power.
 - Complicated governments
 - In the last stage, imperial order had bigger power and many were enforced (1,253 in 1941, 3+ *per day*!!)
- The Japanese jurists attempt to reveal the law system in the period.

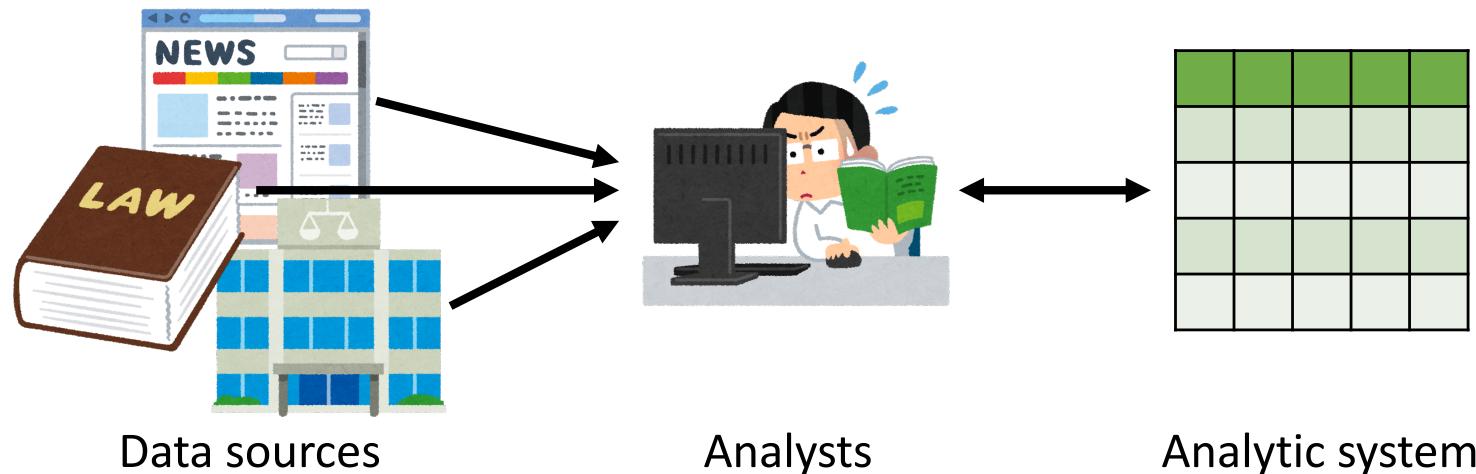
Connecting Laws with related contents

- Cases
 - Case analysis from law's viewpoints, vice versa
 - What are the related cases?
 - What are the relevant laws?
 - Support for lay judges
- Legislation facts
 - Finding reasons for legislations
 - When laws are in drafting and introducing
 - Analysis by jurists



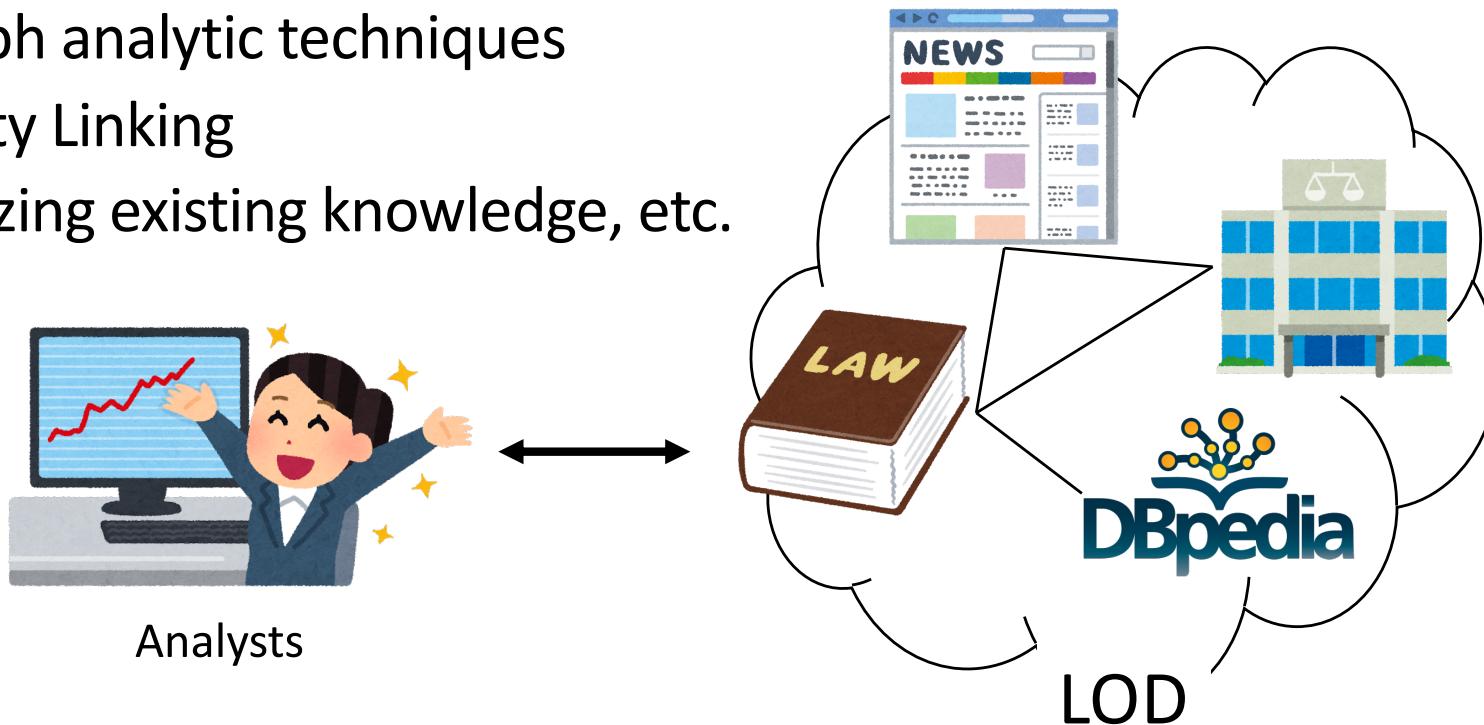
What analysts do? – Find data source by source

- Find and store
 - Search from Law index and put into tables
 - Looking into case documents to find law descriptions.
 - Finding related news from news hosting services and manually evaluating the relevance to laws.
- Analyze



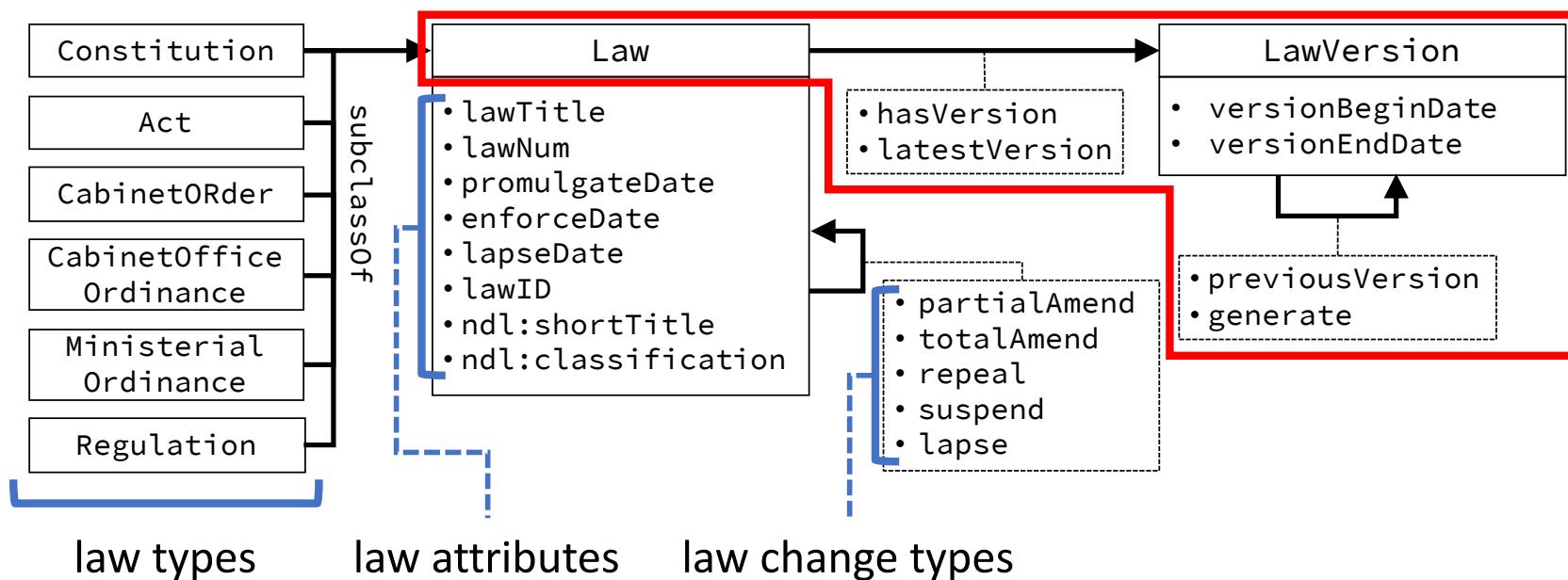
Idea: LOD will provide simpler way of analysis

- LOD (Linked Open Data)
 - Connecting various data through the Web
 - Standardized data format (RDF) and query (SPARQL)
- Values from LOD
 - Graph analytic techniques
 - Entity Linking
 - Utilizing existing knowledge, etc.



Main contribution: Ontology design for law history

- Major issue: complicated amendment relationship
 - Idea: Regarding law amendment as versioning event



Law amendment: Consolidation

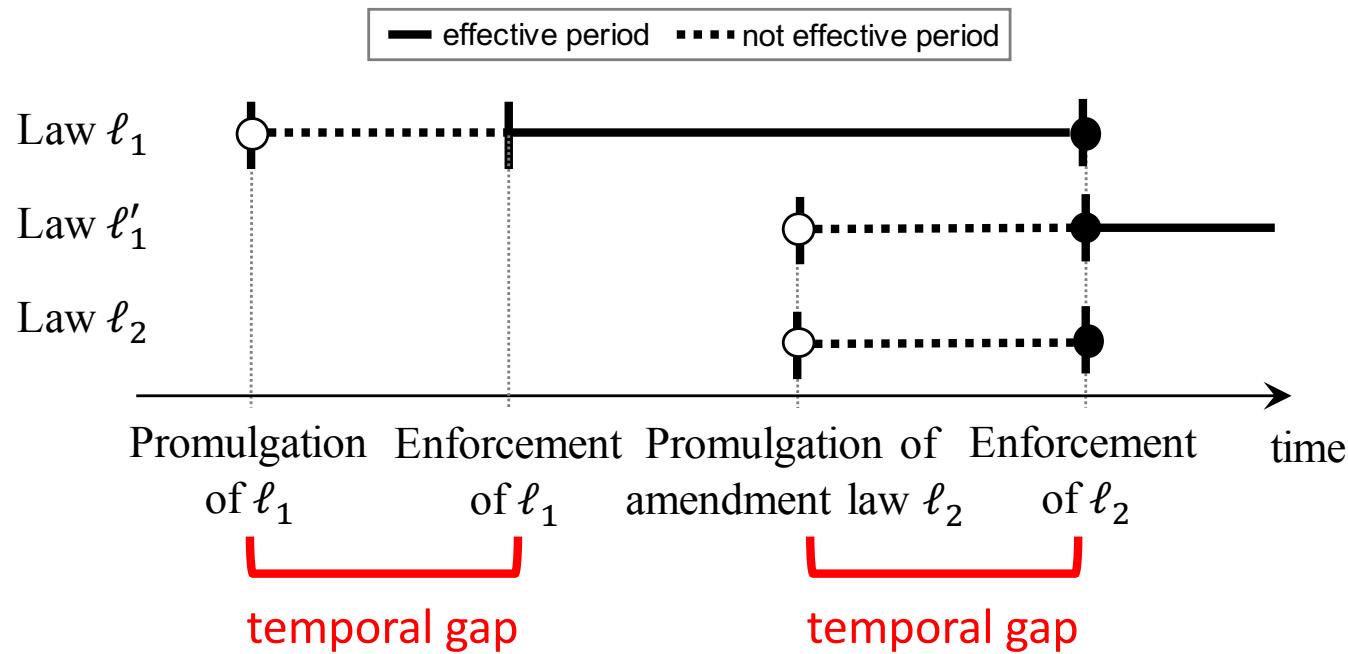
– Amendment by changing (add, delete, replace) the law body.

Amending the Copyright Act (Act No.48, 1970)

| | | |
|----------|---------------|---|
| ℓ_1 | Amend. Law | <p>The following article shall be added to the next to Article 95 in Section 2 of Chapter 4. (Right of transfer)</p> <p>Article 95-2 (1) A performer has the exclusive right to offer that performer's performance to the public through the transfer of a sound or ...</p> |
|----------|---------------|---|

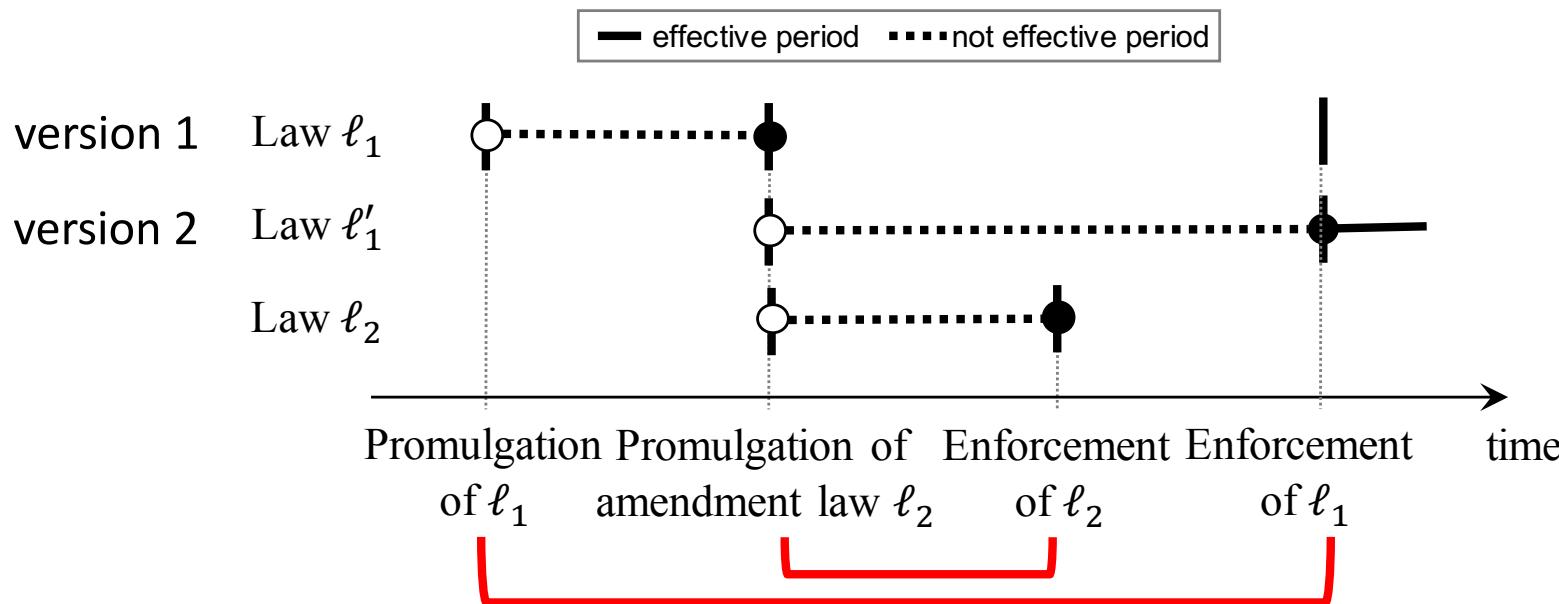
Amendment Timing

- When a law is enforced, the amendment is executed.



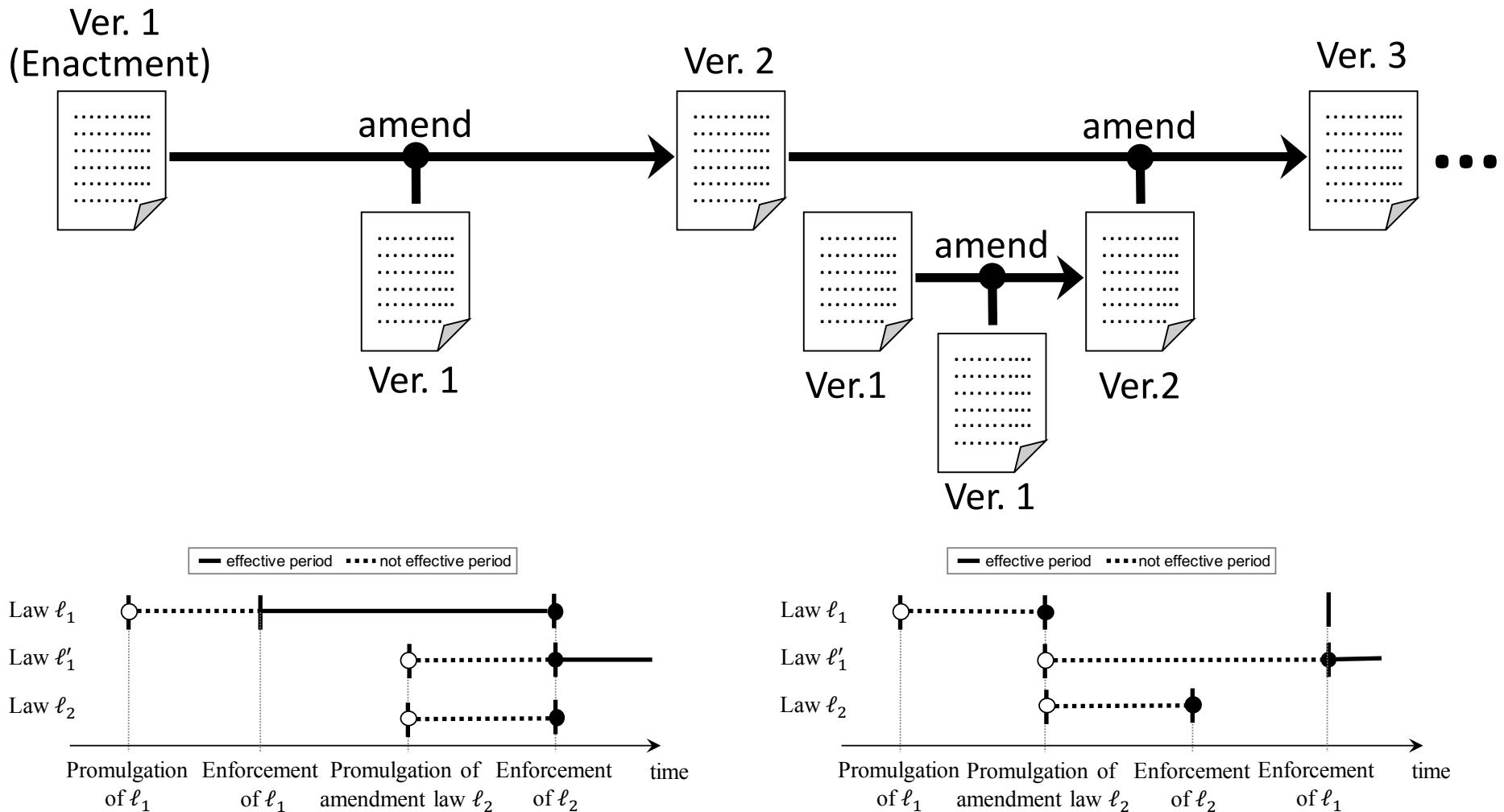
Amendment before Enforcement

- Laws can be amended in-between promulgation and enforcement.



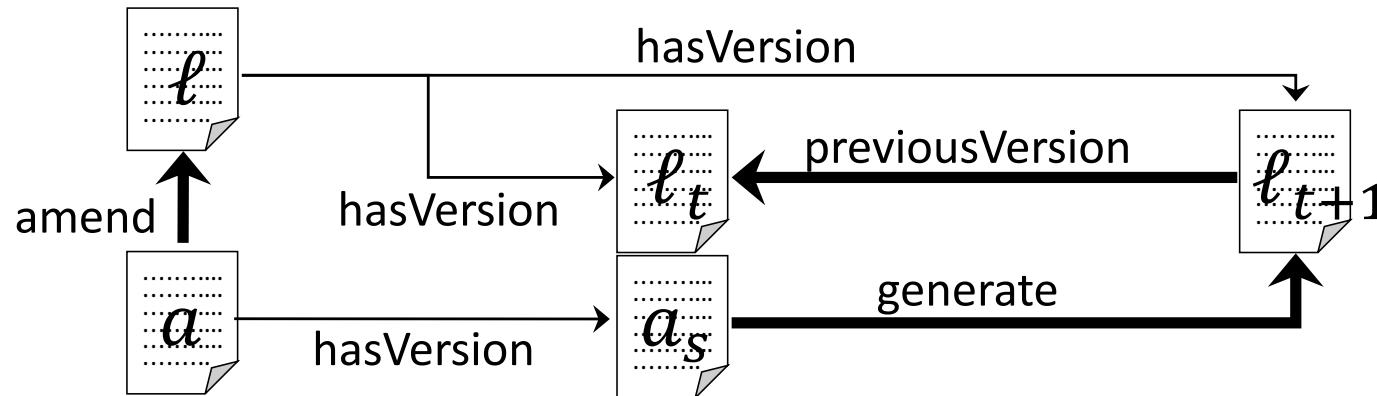
- Version 1 of ℓ_1 had no effect.

Amendment as Versioning

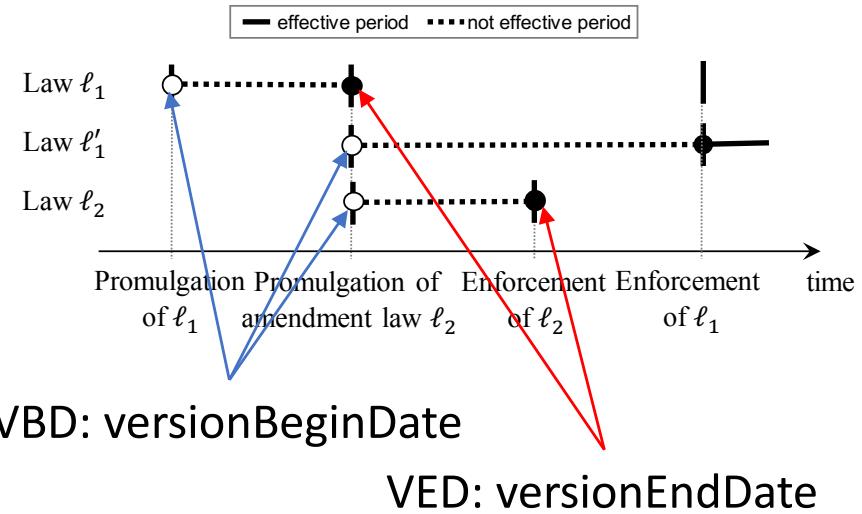
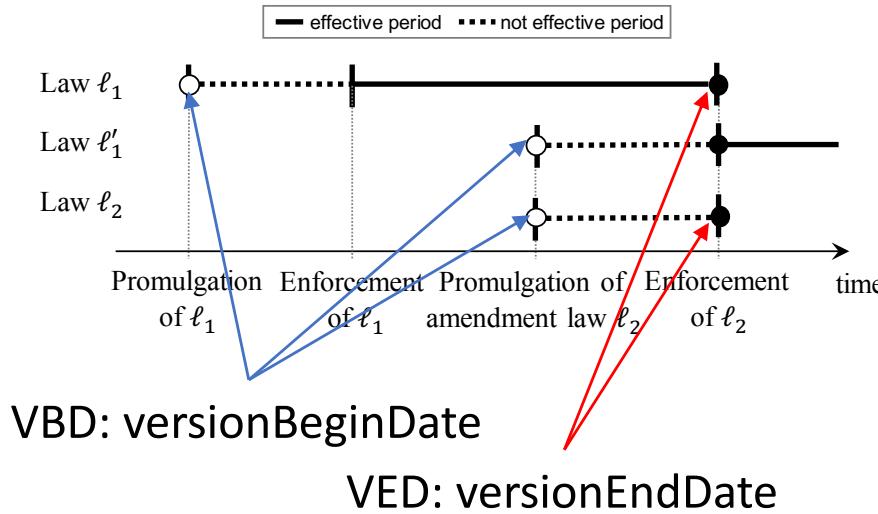


Amendment is **Ternary** relationship

- Version ℓ_t of law ℓ is changed to version ℓ_{t+1} by amendment law a .
 - Amendment is hard to describe in version-version relationship.
- Idea
 - Separate law and law-version.
 - Amendment relationship is defined between Laws.
 - Version ℓ_{t+1} is generated by executed version a_s of law a .
 - Version ℓ_t is the previous version of ℓ_{t+1} .



Effectiveness of Law versions

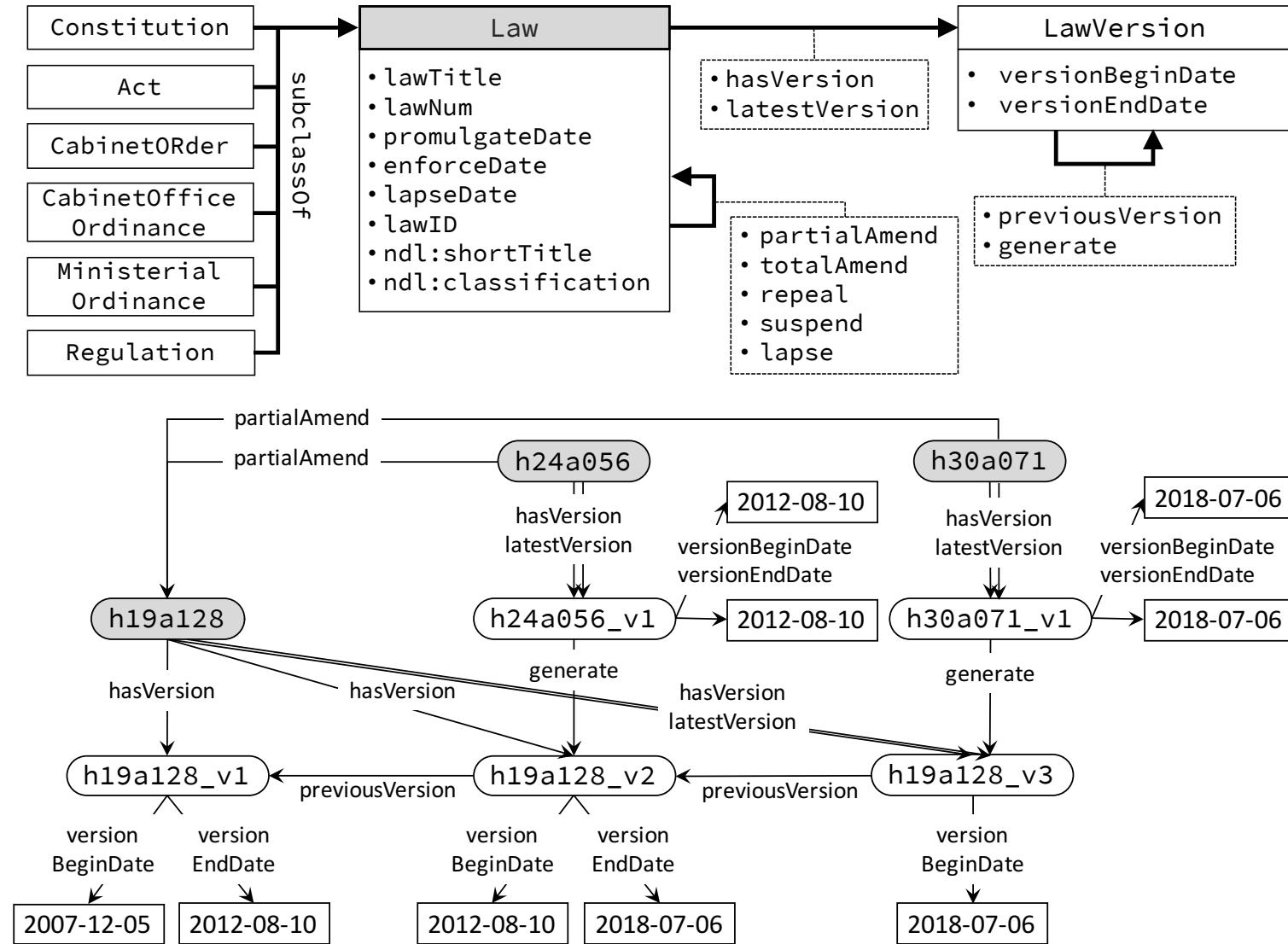


$$\text{effective_period} = \begin{cases} EFD \text{ to } VED \text{ if } EFD < VED \\ \text{none} \quad \text{otherwise} \end{cases}$$

$$\text{non_effective_period} = \begin{cases} VBD \text{ to } EFD \text{ if } EFD < VED \\ VBD \text{ to } VED \text{ otherwise} \end{cases}$$

EFD: Enforcement Date

Proposed ontology and Example data



Use Cases

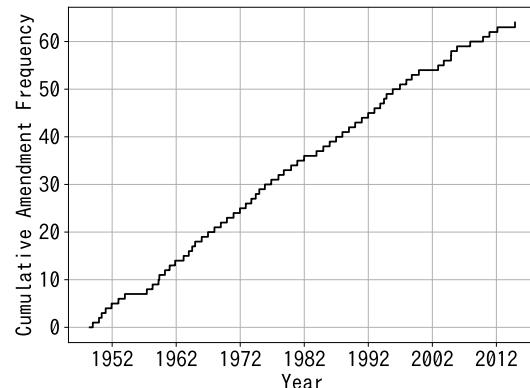
- Dataset
 - Obtained from Japanese Law Index, National Diet Library, Japan
 - <http://hourei.ndl.go.jp>
 - 13,440 laws and 61,841 changes
 - From February 1886 to August 2015
- Use cases
 - Effective Law Version Detection
 - Amendment History Visualization
 - Classification-based Enactment Analysis

Amendment History Visualization

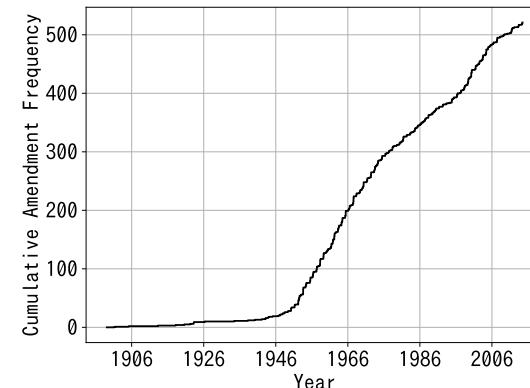
- Observation of amendment tendency for each law
 - Counts are incremented as version begins.

SPARQL
Query

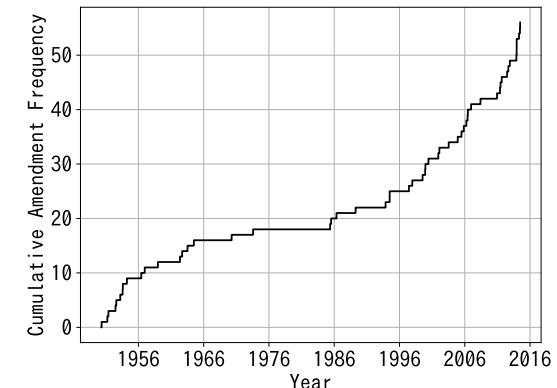
```
SELECT ?versionBeginDate  
WHERE { <lawURI> law:hasVersion ?lawVersion.  
         ?lawVersion law:versionBeginDate ?versionBeginDate.  
 } ORDER BY ?versionBeginDate
```



(a) Salary of judges.

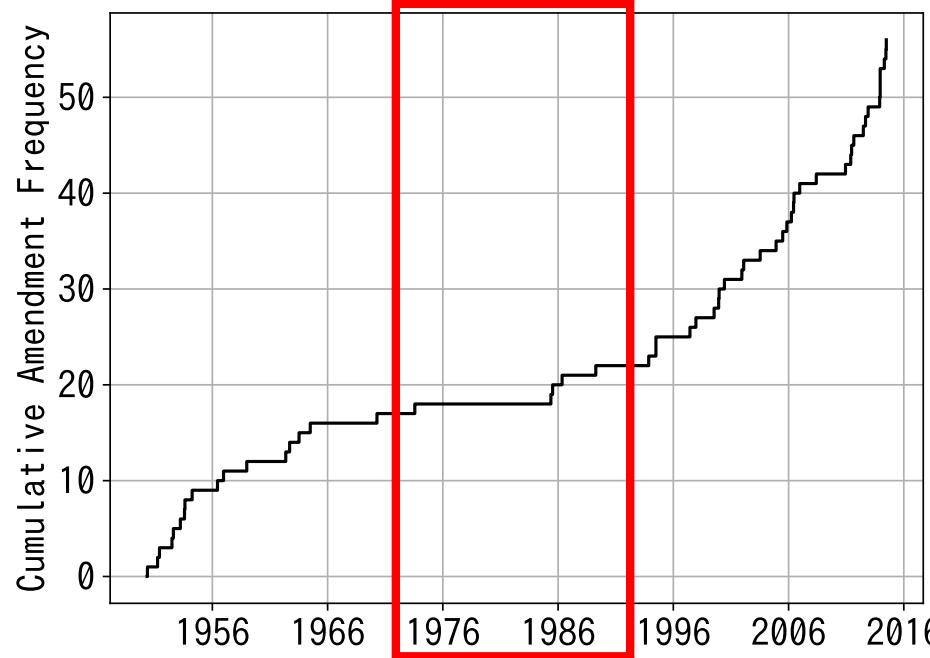


(b) Income tax.



(c) Public assistance.

Observation on Public assistance



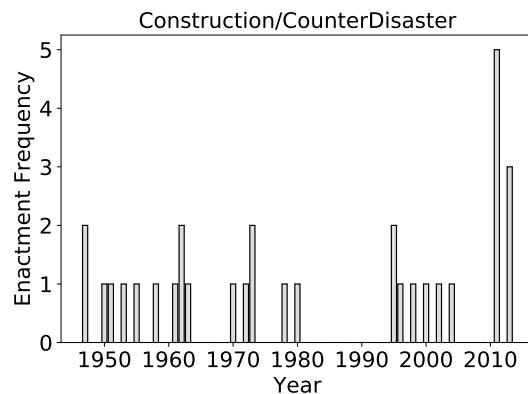
- Few amendments during steadily economically growing (red squared, 1973-1991)
- Increased amendments after the collapse of the bubble economy (1991)

Classification-based Enactment Analysis

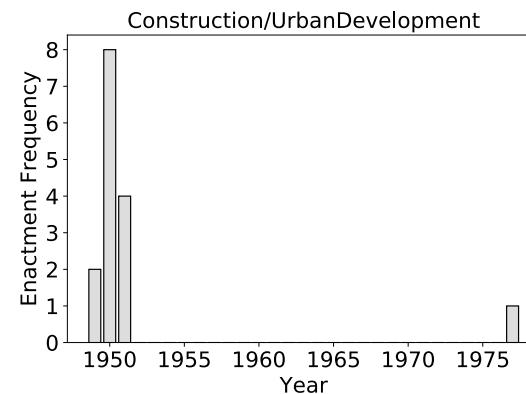
- Observation of enactments in a group of laws

SPARQL
Query

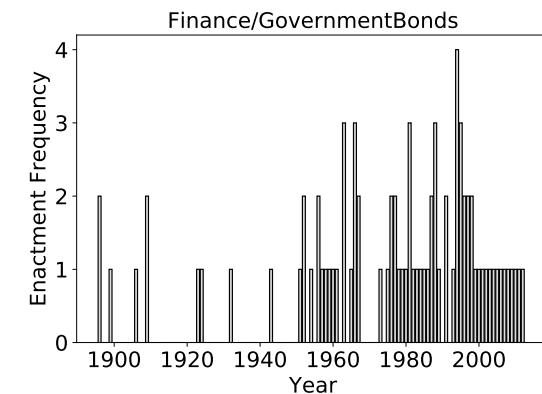
```
SELECT year(?date) count(?law)  
WHERE { ?law rdf:type law:Act;  
          ndl:classification "placeholder";  
          law:enforceDate ?date.  
 } GROUP BY (year(?date)) ORDER BY (year(?date))
```



(a) Counter disaster.



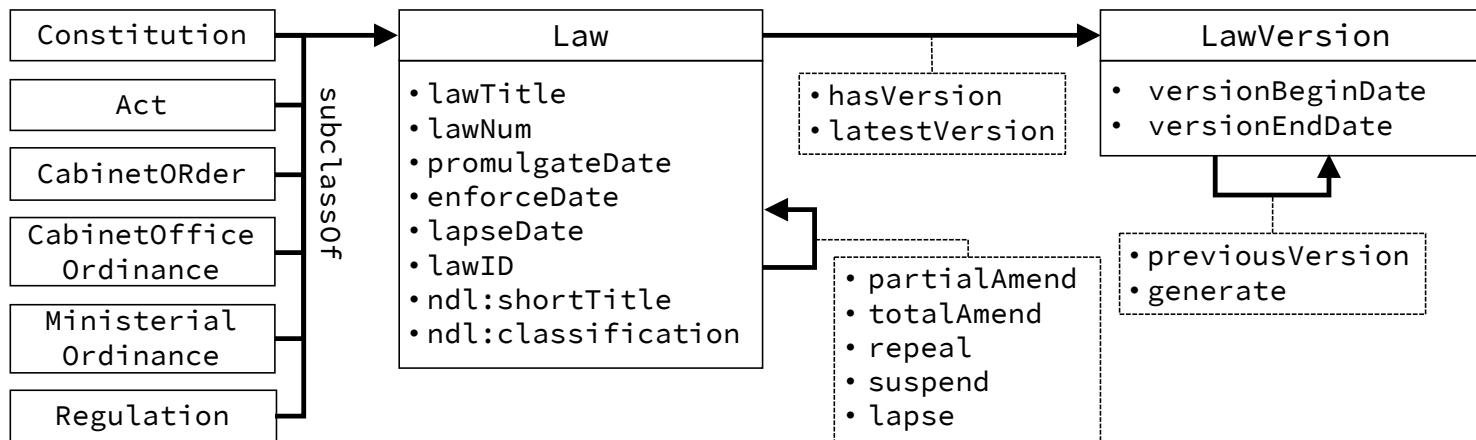
(b) Urban development.



(c) Government bonds.

Conclusion

- Ontology for law history



- Use cases
 - Effective Law Version Detection
 - Amendment History Visualization
 - Classification-based Enactment Analysis