

Legislation Supporting System Based on Legal Computer Programming as SDL (Software Defined Law)

October 12, 2018

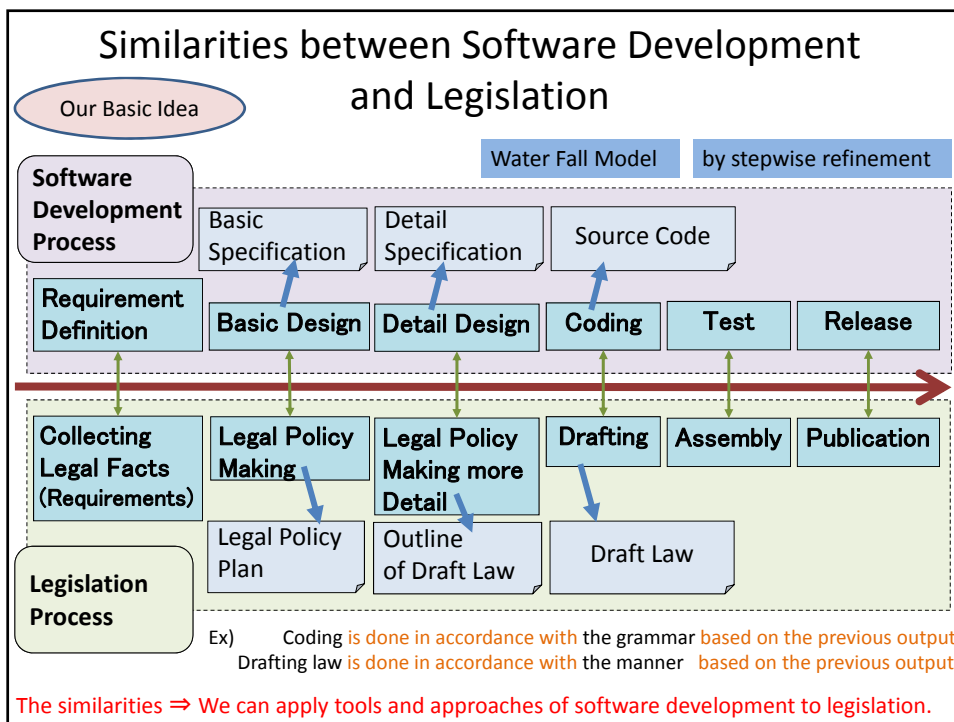
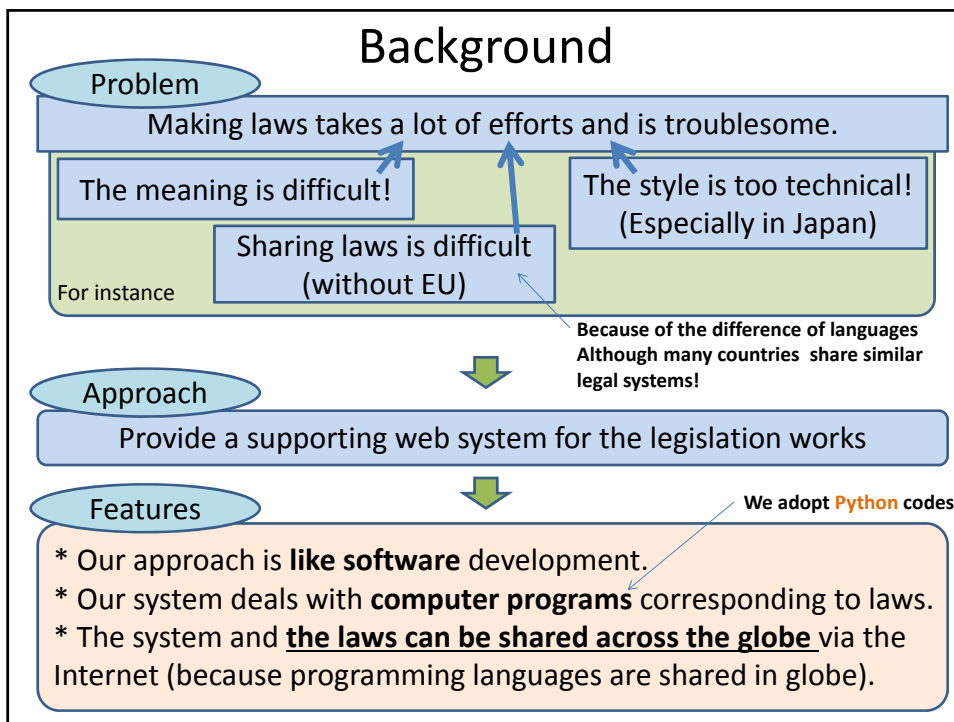
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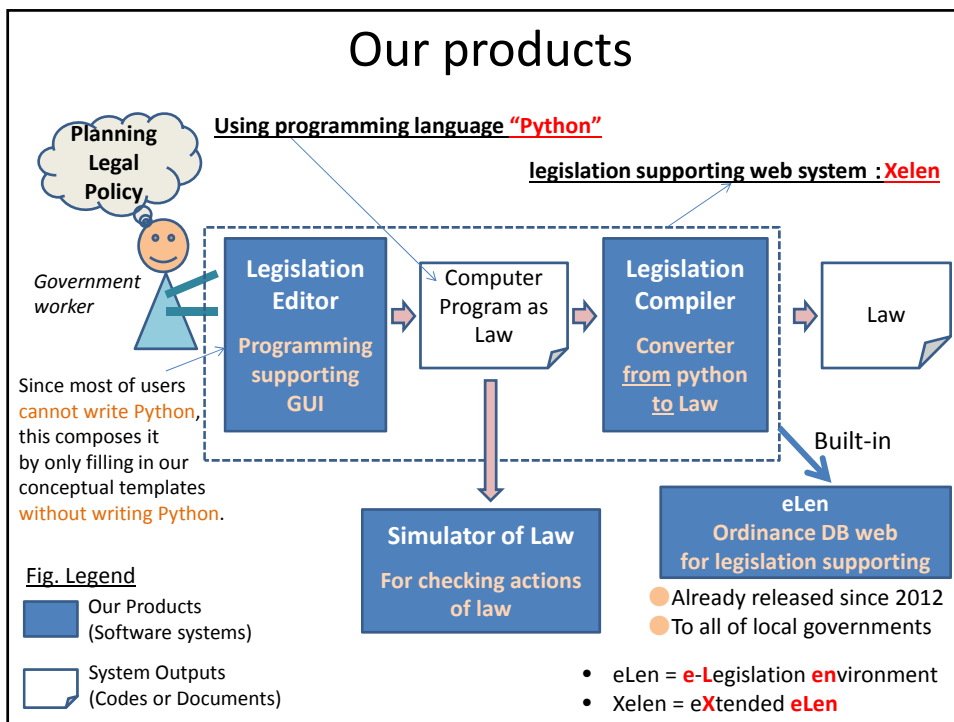
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Agenda

1. Background
2. Basic Idea
 - Similarity between software development and legislation
3. Products
4. Approach
 - SDL (Software Defined Law) by drafting in Python
5. Example and simulation
6. Conclusion
7. Demonstration: Xelen for legislation supporting software





Legislation Supporting Web System: Xelen

If this link is clicked, the system makes the python program.

If this link is clicked, the system convert the python program to the law in natural language.

The user writes values of any items. The items are prepared as typical cases in our system library "LLib".

Development of Law Editor - Internet Explorer

Development of Law Editor - Project
Xelen editor for making law (Demo version) (Edit/Ab)

Programmatic style Provision style [Add Items] [Show/Hide Values] [Expand/Collapse]

(1) Title [Add subitems] [Edit] [Delete]
Ordinance on the XX City Comprehensive Welfare Center

(2) MyCity [Add subitems] [Edit] [Delete]
XX City, ZZ Prefecture

(3) Purpose [Add subitems] [Edit] [Delete]
As the base for amending the activities of local welfare, the XX City Comprehensive Welfare Center shall be established in or

(4) Center [Add subitems] [Edit] [Delete]
facility:
XX City Comprehensive Welfare Center
(4.1) place [Add subitems] [Edit] [Delete]
1-1, ..., XX City, ZZ Prefecture
(4.2) functions [Add subitems] [Edit] [Delete]
LIST
Exchanges of various generations
Hobby-oriented and recreational programs
(4.3) closedDays [Add subitems] [Edit] [Delete]
LIST
Sundays
4 holidays set forth in the National Holidays Act
(4.4) openTime [Add subitems] [Edit] [Delete]
AM0900-PM0400

(5) User [Add subitems] [Edit] [Delete]
role:
Designated administrator

(6) Commission [Add subitems] [Edit] [Delete]
commission_enforcement:
Mayor

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List of workbooks

"Development of Law Editor" Top Abstract Plan Information Workbook

List of All Projects Local Developer Tool

Homepage of Prof.Fukuda

eXtended eLen (Xelen) on NLS Syllabus System V2/2004-2018CJT Fukuda

Our Approach : **SDL** (Software Defined Law)

Our systems are designed based on our SDL approach as drafting law in **Python**.

SD approach is a trend of IT area.

Ex) **SDN** : Software Defined Network

SDS : Software Defined Security

Our project also takes advantage of the trend. :P

SDL Approach:

- Can simulate situations of laws **directly**.
 - Makes descriptions of law more precise and objective than drafting the law in natural language.
 - Can divert knowledge and tools from software developments.
 - Is language independent.
- ⇒ Can share the knowledge of similar legal systems among countries (across the globe).

Ordinance on the XX City Comprehensive Welfare Center

Sample Ordinance

(Purport)

Article 1 As the base for promoting the activities of local welfare, the XX City Comprehensive Welfare Center shall be established in order to achieve the promotion of health and social participation.

(Establishment)

Article 2 The XX City Comprehensive Welfare Center (hereinafter referred to as the "center") shall be established at 1-1, ..., XX City.

(Services)

Article 3 The center provide the following services:

- (1) Exchanges of various generations
- (2) hobby-oriented and recreational programs

(Holidays)

Article 4 The center closes on -

- (1) Sundays, and
- (2) a holiday set forth in the National Holidays Act.

(Hours of Opening)

Article 5 The center runs from 9 a.m. to 4:30 p.m., opening hours.

(Designated Administrators)

Article 6 The mayor shall designate juridical persons or other organizations to administrate the center.

(Permission of Utilization)

Article 7 A person who intends to utilize the center must obtain the permission from the designated administrator.

(Fee)

Article 8 A person who has obtained a permission must pay a fee for the utilization of the center.

(User Responsibilities)

Article 9 Users of the center must not transfer or sublease the right which has arisen from the permission of utilization.

```

module: Wcenter.py

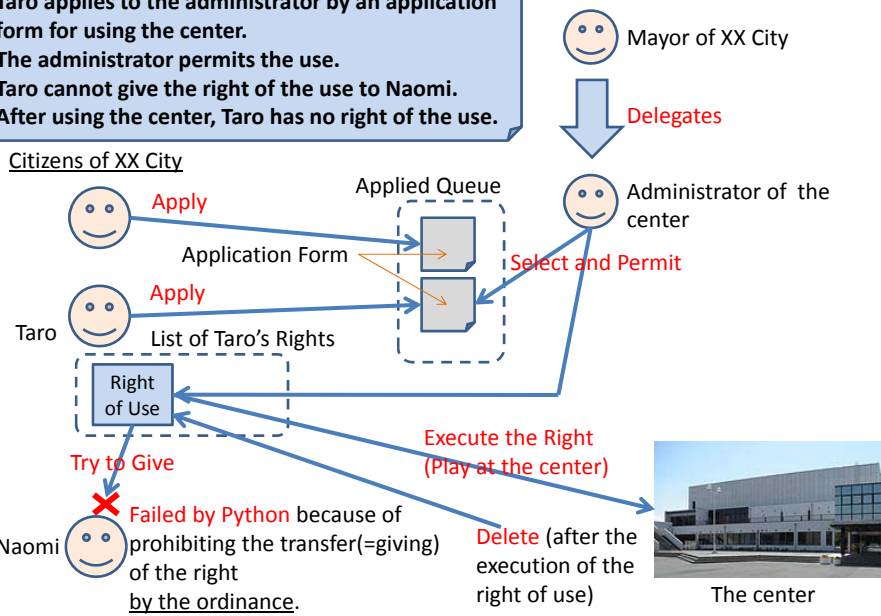
from LLib import *
MyCity= Cities["XX City, YY Pref."]
Title="Ordinance on the XX City Comprehensive Welfare Center"
MyCity="XX City, YY Pref."

Purport="As the base for promoting the activities of local welfare, the XX City
Comprehensive Welfare Center shall be established in order to achieve the promotion of
health and social participation."
Center=facility( "The XX City Comprehensive Welfare Center" )
Center.place="1-1, ..., XX City"
Center.functions=[ "Exchanges of various generations", "hobby-oriented and recreational
programs" ]
Center.closedDays=[ "Sundays", "a holiday set forth in the National Holidays Act" ]
Center.openTime="AM0900-PM0430"
Center.admin=role("group",do("allowed",MyCity.Mayor,permit("administrate",Center))))
User=role("human",do("allowed", Center.admin,permit("use",Center)))
User.obligation.append(do("pay", MyCity, fee("use",Center)))
User.obligation.append(prohibit("give", anyone(), User.rigts))
User.obligation.append(prohibit("lease", anyone(), User.rigts))
Commission=commission_enforcement(MyCity.Mayor)
Forms={1:newform('user'),12:newform('admin')}
    
```

The Sample Law Program Described in Python

Sample Case for Python Simulation of Law

Taro applies to the administrator by an application form for using the center.
 The administrator permits the use.
 Taro cannot give the right of the use to Naomi.
 After using the center, Taro has no right of the use.



Simulation log for the sample case

```

from LLib import *
import Wcenter
Mayor=Cities["XX City"].mayor
Admin=Wcenter.admin
User=Wcenter.user
X=corporation("Takahashi Corp.")
Form=getform(Wcenter.Forms[12])
Form.name=X.name
Documents={"plan", "xxx.doc"}, {"articles of incorporation", "yyy.doc"}
apply(Admin, X, Mayor, Form, Documents)
assign(Mayor, Admin.ApplQ["Takahashi Corp."])
print '>'+Admin.members[0].name
>Takahashi Corp.
Y=person("Taro Yamada")
Y.age=35
UForm=getform(Wcenter.Forms[1])
UForm.name=Y.name
UForm.date="2018/10/11"
UForm.place="U-type room"
apply(Y, Admin, User, UForm, 300)
permit(Admin, User.ApplQ["Taro Yamada"])
Z=person("Naomi Suzuki")
Z.age=25
print '>'+Y.Rights[0].type
>use
print '>'+exec(Y, "give", Z, Y.Rights[0])
>False
exec(Y, "execute", Y.Rights[0])
print '>'+Y.Rights
>[]

```

Preparations of Python environments

Administrator application

Mayor assigns

User(Taro) application

Permission of Use

User actions

We check Taro's final states.

Conclusion and Our Hope

Conclusion :

- Our proposal is SDL approach for drafting laws by Python as the drafting software.
- Our SDL system is "Xelen". (The demonstration is later.)

Our Hope :

If many countries can collaborate to provide and send both their own laws in natural language and its Python codes to us, we can also enrich Xelen more by machine learning.

As a result, new style of Legislation by Xelen can be used and shared in all over the world via the Internet (=across the globe).

Continue with our demonstration ...

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Demonstration
Xelen System
(under development)