A Model for Understanding the Urban Transformation

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MODEL

Three layered "CSO model" for describing long history of our cities

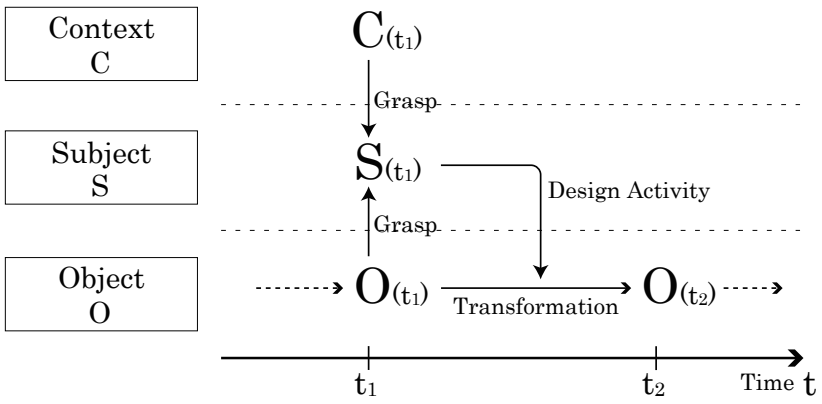
In this study, we describe and analyze the urban design and transformation process. We have based our study on the theoretical "CSO model," which consists of three layers:

+ C (Context)
+ S (Subject)
+ O (Object)

The process of urban transformation is difficult to understand because of the following factors:

+ Continuity (it is a continuous process over thousands of years and never ends.)
+ Complexity (buildings, windows, roads, cars, infrastructure, trash,...)
+ Multiplicity of subjects (governments, planners, companies, citizens,...)
+ Multiplicity of purposes (governance, safety, economy, religion,...)

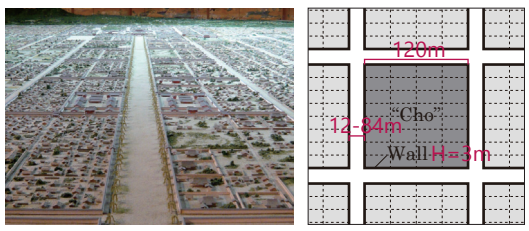
We aim to describe the transformation process with the CSO model, in which we have incorporated four elements (t, O, S, C) that correspond to the four factors mentioned above.



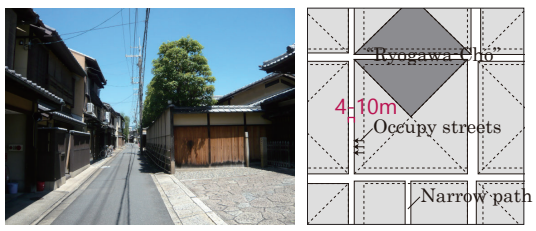
EXAMPLE

Applying the CSO model to the case study of Kyoto's street system, which has a 1200-year history

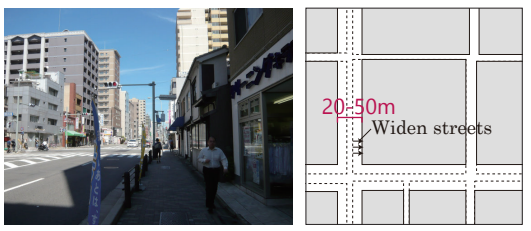
1) The initial Kyoto plan called "Heiankyo" was designed by Emperor Kanmu with a strict grid system.

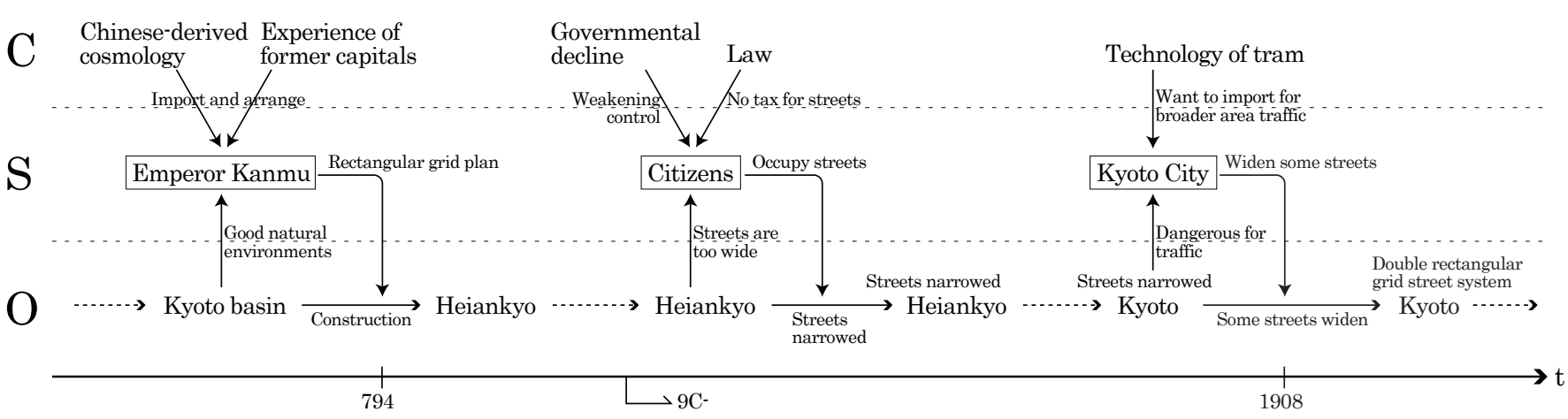


2) When the government declined, citizens began to change the urban structure on their own.



3) The Kyoto city government decided to widen some streets to introduce the tram.





NOVELTY

Comparing our research with earlier design theories advocated by the following:
Christopher Alexander
Lawrence Halprin
Donald Schön
Yrjö Engeström
...

	Research Goal	Time Span	What is "Design"?	Design Subject(s)
Earlier Studies -Micro Design Theory-	Knowledge about "how to do good design," which demands practical research for current designers.	A short time span limited to few years. In this process, researchers can experience the whole process on their own.	Attempt to somehow create a "good" product or system.	Design activities are conducted by an individual or a team that consists of collaborative members.
Our Study -Macro Design Theory-	Description of complex history of design activities throughout the world.	Long, up to hundreds of years. Researchers have to refer to historical materials belonging to many centuries.	Each activity linked to changes in our city. It is impossible to categorically say what is "good" as judgment depends on person and time.	There are many individuals and teams, but they do not necessarily collaborate with each other.

QUESTIONS

What we can discuss by using our model

Intention of Subject

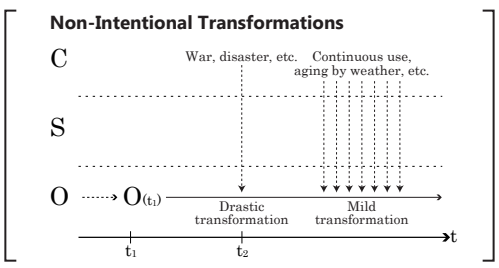
The CSO model does not imply that design activity is decided automatically by a deductive approach. We humans have our own intention. Based on intention, subjects can decide what to abstract as context and object, what to achieve by the design activity, and how to design practically. However, apart from intentional design, the city can also transform through tragedies and continuous operations or practices.
The question is whether such unintentional transformations can be designed intentionally.

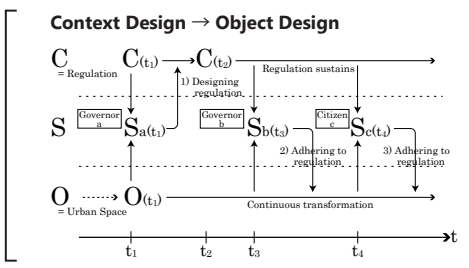
The World and Design

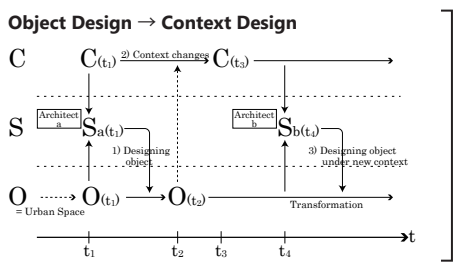
Context includes various elements like space, community, administration, economy, technology, history, etc. In fact, the entire world can be the context for design activities. This is because all subjects exist within the world.
The boundary between context and object is complicated too. For example, townscape can be the context when an architect designs a building, but it can be described as the object if the architect tries to make the townscape better by designing a building.

Extent of Design

We can also design the context. Governments establish building regulations (context) to control continuously urban transformation (object). Technological development can also be a powerful context for urban space. At the same time, we can change the context by designing the object. That is what many contemporary architects attempt to do.
Design activities affect not only the direct object but also the world itself. Can designers anticipate such an effect? Did car inventors predict traffic jams and widespread cities of today?







ONGOING

Toward entire and structural comprehension of urban transformation

Categorization

We are in the process of categorizing contexts, subjects and objects of Kyoto's urban history.

[Context]
+ Politics and governance
+ Economy
+ Military affairs
+ Rules
+ Religion
...

[Subject]
+ Emperor and royal family
+ Nation (after modernity)
+ Local government
+ Religious organization
+ Citizens
...

[Object]
+ Buildings
+ Public spaces
+ Infrastructure
+ Streets
+ Townscape
...

With the help of such categorization, our aim is to describe and analyze the urban history statistically. The study will include the following:

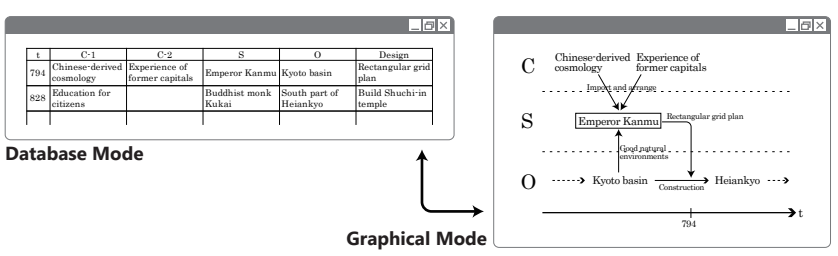
+ Correlation between various categories of contexts, subjects and objects.
+ Historical changes observed in the each categories.
+ Relation between events.

This analysis may help us probe the following:

+ Does the religious context tend to be less important throughout history?
+ Is technological progress more effective in urban transformation than political decisions?

Computational Modeling

We aim to make the description and analysis of urban history easier and more interactive with the help of computer programming. For example, it would be possible to isolate "religious" urban transformations by clicking the "religion" category on the interface. We are developing such a system by using the Python programming language.



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