

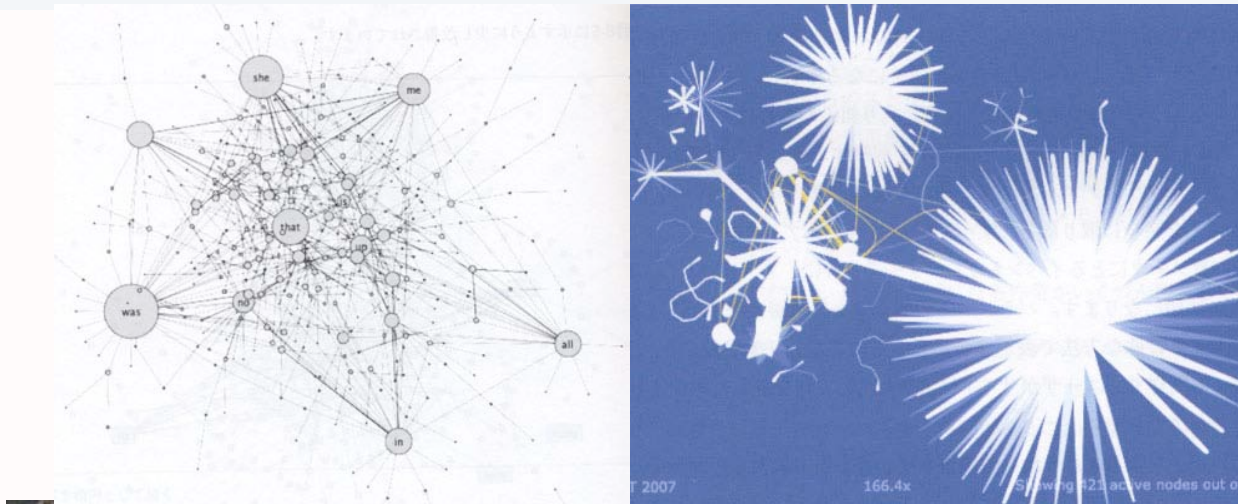
A Platform for Visualizing and Sharing Collective Cultural Information

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Introduction

- The era of “infoglut”
- How to cut back “cognitive load”
- Study of “Information visualization”
 - How to express a vast amount of information in easy-to-understand ways?

Information Visualization



Purpose

- Development of interactive Web-based applications which can reduce cognitive load and can contribute to the humanities in general.
 - How to express a vast amount of information
 - How to integrate official information and individual narratives
 - Collective cultural information

Focusing on the Cube

- Let's pack various knowledge into a **cube**!
- KACHINA CUBE (KC)
 - Stratum modeling
 - 2 dimensions for a **map**
 - 1 dimension for a **time-line**
 - Adding “**Cultural Fragments (CF)**” into the cube
 - Objects that represent fragments, cultural, historical or phenomenal.
 - CF can include textual information, as well as visual and moving images.
 - Therefore, any users can add CF into the cube easily.

Visual or
Moving Image

The screenshot displays the 'KACHINA CUBE' interface. On the left, an 'INFO' panel is circled in red and labeled 'Textual Information'. It contains the following data:

ID	28	YEAR	1904年6月30
TITLE	通達區及區の海島(浮城野原)の調査		
NAME	matsumoto		
DATE	2008年12月20日 18時50分05秒		
COMMENT	当時の雲の海は、現在のそれとは異なるのでない。		

A red arrow labeled 'Click' points to a red square on the 3D map, which is also labeled 'CF'. A blue double-headed arrow labeled 'Time-line' runs vertically on the right side of the map, with 'New' at the top and 'Old' at the bottom. On the far right, a video player window is circled in red and labeled 'Visual or Moving Image', showing a photograph of an interior space. The interface also includes a 'BROWSE' button on the left, an 'EDIT' button on the right, and a 'NARRATIVE' bar at the bottom.

Textual
Information

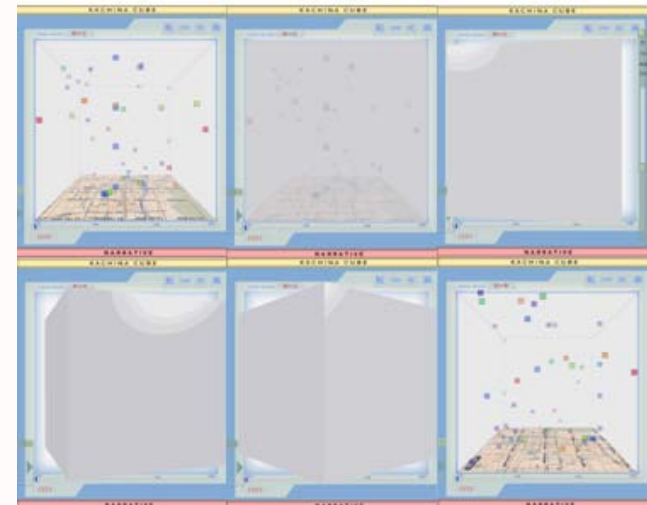
New

Time-line

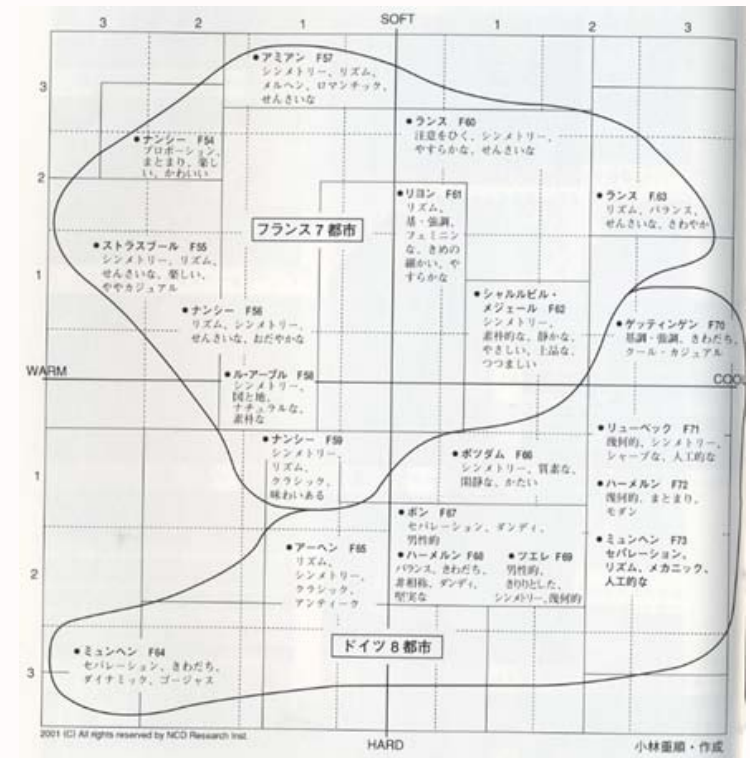
Old

Implementation

- KC's distinguishable functions
 - Rotation function
 - Narrative function
 - OPP (Obligatory Passage Point) detector
 - Visual Search-engine
(Implementation-in-process)



Two Types of Maps



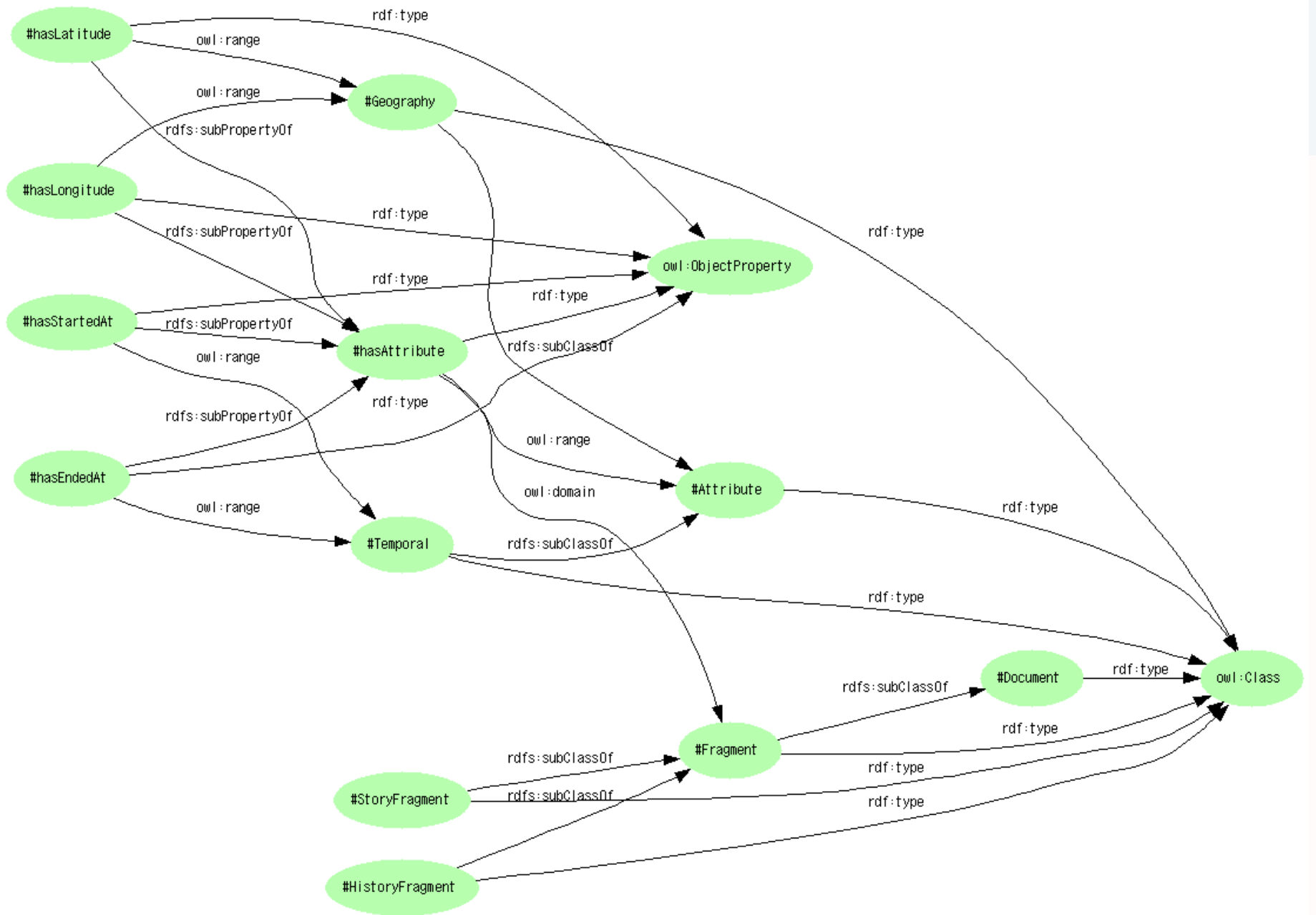
Sharing Information

- RDF/OWL to export the data.
 - Two main way to use:
 - 1. To retrieve information of plotted fragments
 - Information fragments including spatiotemporal ones.
 - 2. To retrieve storyline data
 - A storyline which consists of sequence of fragments.

Fragment class/properties

```
<owl:Class rdf:ID="Attribute">
</owl:Class>
<owl:Class rdf:ID="Geography">
  <rdfs:subClassOf rdf:resource="#Attribute" />
</owl:Class>
<owl:Class rdf:ID="Temporal">
  <rdfs:subClassOf rdf:resource="#Attribute" />
</owl:Class>
<owl:Class rdf:ID="Document">
</owl:Class>
<owl:Class rdf:ID="Fragment">
  <rdfs:subClassOf rdf:resource="#Document" />
</owl:Class>
<owl:Class rdf:ID="HistoryFragment">
  <rdfs:subClassOf rdf:resource="#Fragment" />
</owl:Class>
<owl:Class rdf:ID="StoryFragment">
  <rdfs:subClassOf rdf:resource="#Fragment" />
</owl:Class>
```

```
<owl:ObjectProperty rdf:ID="hasAttribute">
  <owl:domain rdf:resource="#Fragment" />
  <owl:range rdf:resource="#Attribute" />
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasLatitude">
  <rdfs:subPropertyOf rdf:resource="#hasAttribute" />
  <owl:range rdf:resource="#Geography" />
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasLongitude">
  <rdfs:subPropertyOf rdf:resource="#hasAttribute" />
  <owl:range rdf:resource="#Geography" />
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasStartedAt">
  <rdfs:subPropertyOf rdf:resource="#hasAttribute" />
  <owl:range rdf:resource="#Temporal" />
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasEndedAt">
  <rdfs:subPropertyOf rdf:resource="#hasAttribute" />
  <owl:range rdf:resource="#Temporal" />
</owl:ObjectProperty>
```



Applications

- **Geographic maps**

- Most appropriate for local history research
 - Used for archive construction of the cities of Kyoto and Matsuyama.
 - Awareness that accumulation of a lot of events makes culture.
 - Collectiveness of culture gets exposed.

- **Conceptual maps**

- Suitable for visualization of trials or controversies
 - Visualization of the process of a murder case trial enables us to get an overhead view of allegations made by many people.

計画	x誘	西誘	西計画	拳銃	示唆	西指示	出発	話題	分担	準備	発砲
無	軍服取引補助	非告知	詳細非告知	喧嘩のため	殺人示唆無	無	拳銃売買のため	計画以外	無	拳銃売買のため	
				計画のため			喧嘩のため		喧嘩のため		射殺
有	軍服買入依頼	告知	詳細告知	喧嘩のため	殺人示唆有	有	計画のため	計画	計画のため	計画のため	

KACHINA CUBE

INFO: USER: fukuoka@A

VIEW MODE: 東⇒西 転 ZOOM RE 画

EDIT

FILESIZE: 58072 bytes

黒田「競馬の争い事である」西「丸く収まる方法はない」「(拳銃代の)金が無いので私について来れば5万円やる」

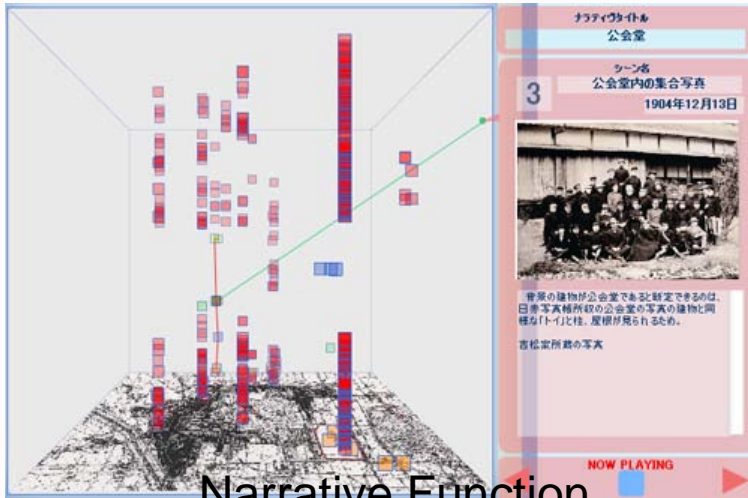
サウエル製ピストル

検察側の主張

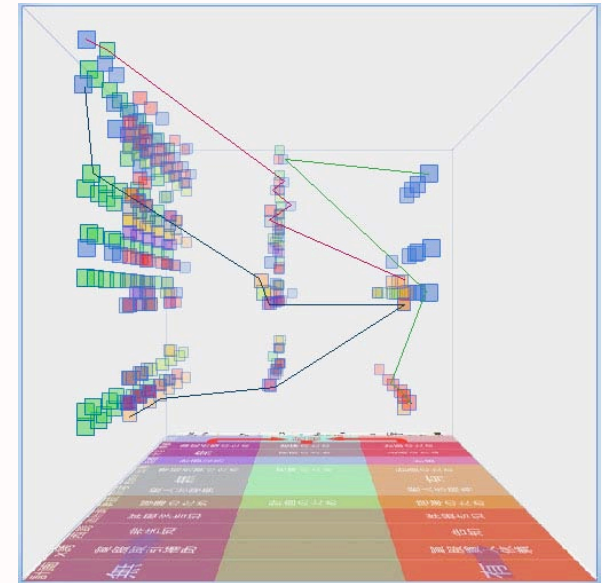
弁護側の主張

NARRATIVE

Line Drawing



Narrative Function

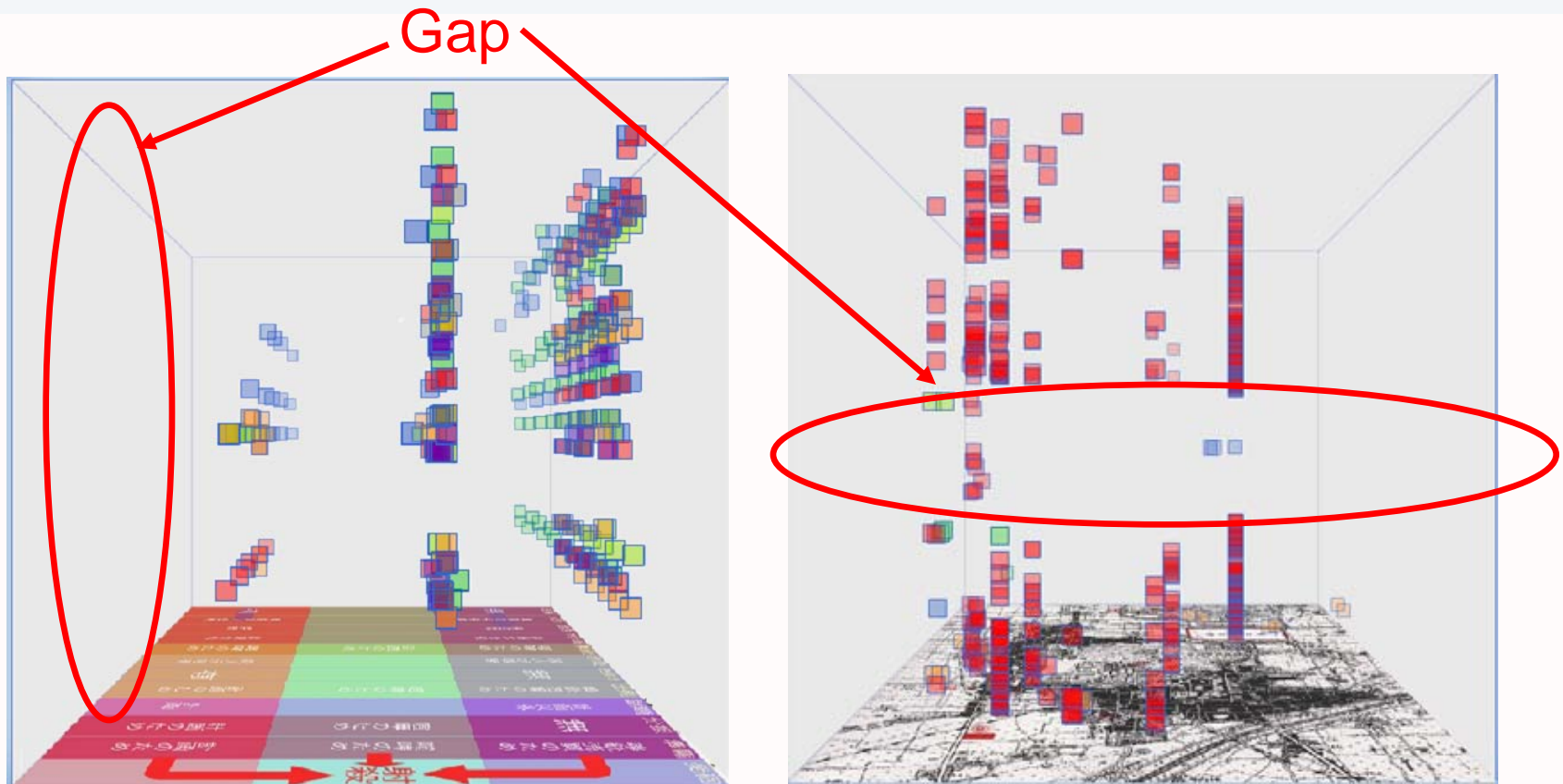


Visual Search-engine



OPP Detector

Finding "Gaps"



It visualized existence of some "gaps" with no fragments distributed, which helped them form hypotheses.

Conclusions

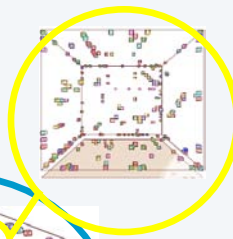
- Packing various information into one cube can reduce cognitive load.
- This architectonics can fundamentally change ways to organize and browse information, as well as support visualization of a "scheme of things" very well.

Prospects

- Construction of “nesting-cube” structure
 - All of fragments in the KC are defined as independent cubes in this structure.
 - We can make a recursively-defined cube severalfold. ▫
 - A vast amount of information can be organized hierarchically.

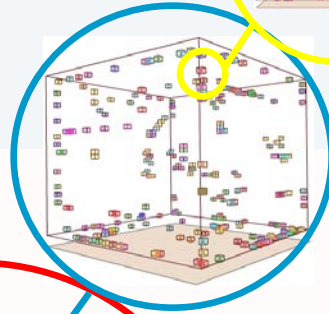
Fourth-layer Cube: John Lennon

Information includes: Yoko Ono, Rickenbacker, Dakota house .. etc



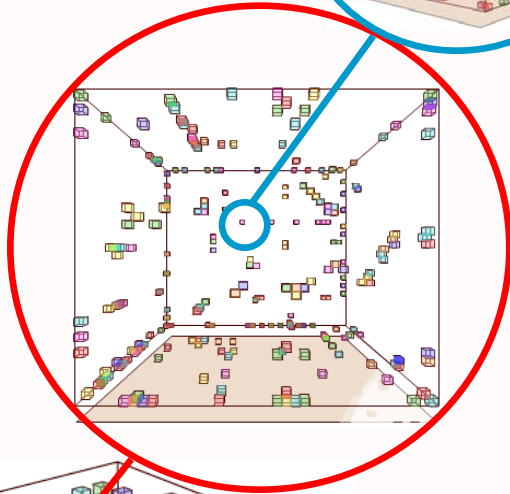
Third-layer Cube: The Beatles

Information includes: John Lennon, Apple Records, George Harrison ..etc



Second-layer Cube: Liverpool

Information includes: The Beatles, John Horton Conway, Simon Rattle,..etc



Base-layer Cube: England

Information includes: London, Liverpool, Oxford, ..etc

