

Towards Social Application and Sustainability of Digital Archives:

The Case Study of 3D Visualization of
Large-scale Documents of the Great
Hanshin-Awaji Earthquake

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1. Introduction **2012**

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1-1. Visualizing archives

- Archives in society
- Need for the archives
- (e.g., for the Great East Japan Earthquake)
- The issue is how to use the information in archives.

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1-1. Visualizing archives

- Purpose:
- Exploring a way to access key information in order to increase sustainability and social merit of digital archives
- Developing a system that visualizes the information database

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2. Visualization **2012**

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2-1. Target of the visualization

- The target of the visualization was archive of Great Hanshin-Awaji Earthquake*
- It included the information of experience and knowledge of the earthquake for the future.
- Information are separated into 4 parts based on the periods.
- Original documents are organized by the contents such as the situation of the damage or the infrastructure.

※The Great Hanshin-Awaji Earthquake hit in January 1995. The archive is in the website, http://www.bousai.go.jp/1info/kyoukun/hanshin_awaji/index.html

2-1. Target of the visualization

Table 1. The contents of the archive (from Cabinet Office, Government of Japan)

Period 1 (from the time earthquake hit to 72 hours after)	Period 2 (from 4 day to 3 weeks after the earth quake hit)	Period 3 (from 4 weeks to 6 months after the earth quake hit)	Period 4 (after 6 months since the earth quake hit)
1-01.Earthquake hit 1-02. System in the beginning	2-01.Operating and governing evacuation centers 2-02.Supporting life in disaster area	3-01.Building emergency dwelling 3-02.Rebulding residences and life	4-01.Reconstruction of life 4-02.Revival of industry and cities
1-03.People's behavior 1-04.Rescue and emergency medical treatment 1-05.Handling fire	2-03.Determining the situation 2-04.Volunteers 2-05.Re-establishing the urban infrastructure	3-03.Planning reconstruction 3-04.Demolish disaster-damaged building 3-05.Industry recovery	
1-06.Emergency transportation 1-07.Foods and supplies 1-08.Health and hygiene 1-09.Lifeline 1-10.Reactions of companies 1-11.Prevention of second disaster			

2-2. Using KACHINA CUBE system

- We used KACHINA CUBE that has three dimensions -- geographical 2D space map and time line on the vertical axis

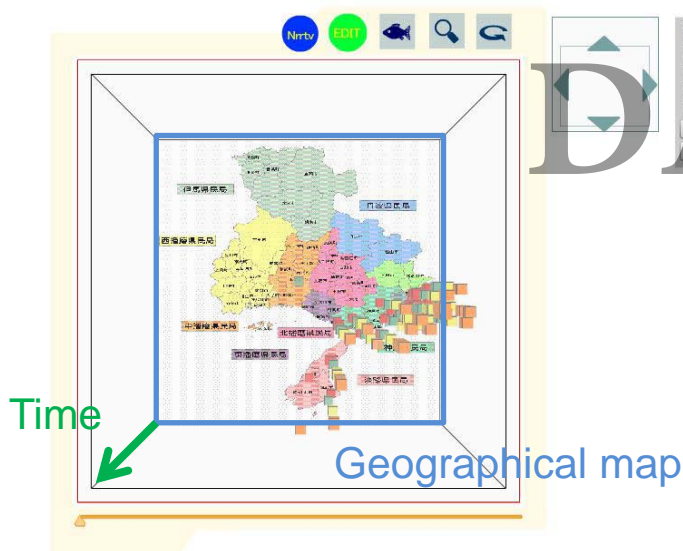


Figure 1. KACHINA CUBE seen from the top

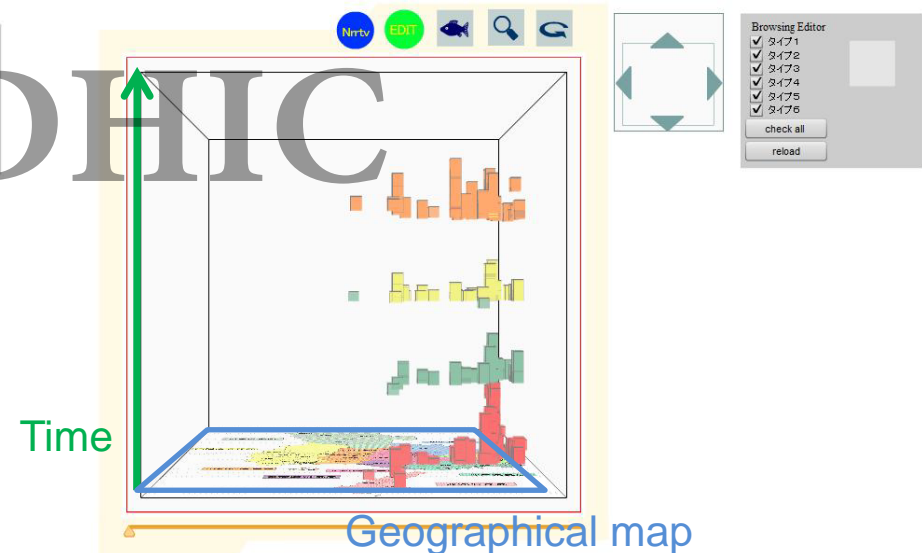


Figure 2. KACHINA CUBE seen from the front

2-3. Data input

- Procedure:
- We put into the system and display the information including the name of municipalities (cities, towns and villages).
- The number of the information fragments in the KACHINA CUBE system was over 1,000 in total. (In archive, there were thousands numbers of them.)

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3. Results and findings

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3-1. Findings from visualization

- We can see where and in what period, how much information exist.
- The system enables us to access the original description of archive.

3-2. KACHINA CUBE on internet

- <http://www.arc.ritsumei.ac.jp/kachina/ken/ps2/shinsai.swf>

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3-3. KACHINA CUBE in this study

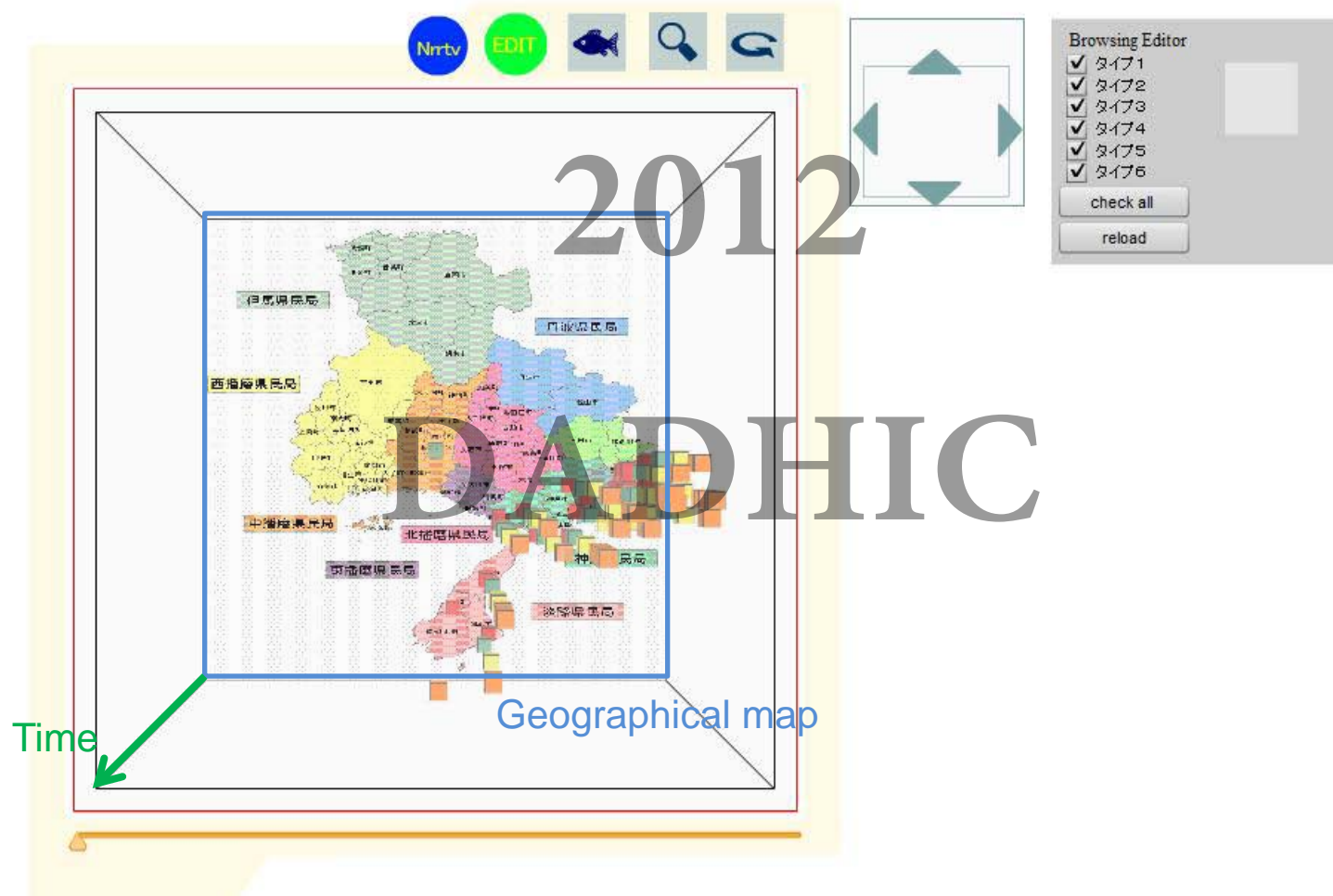


Figure 1. KACHINA CUBE seen from the top

3-3. KACHINA CUBE in this study

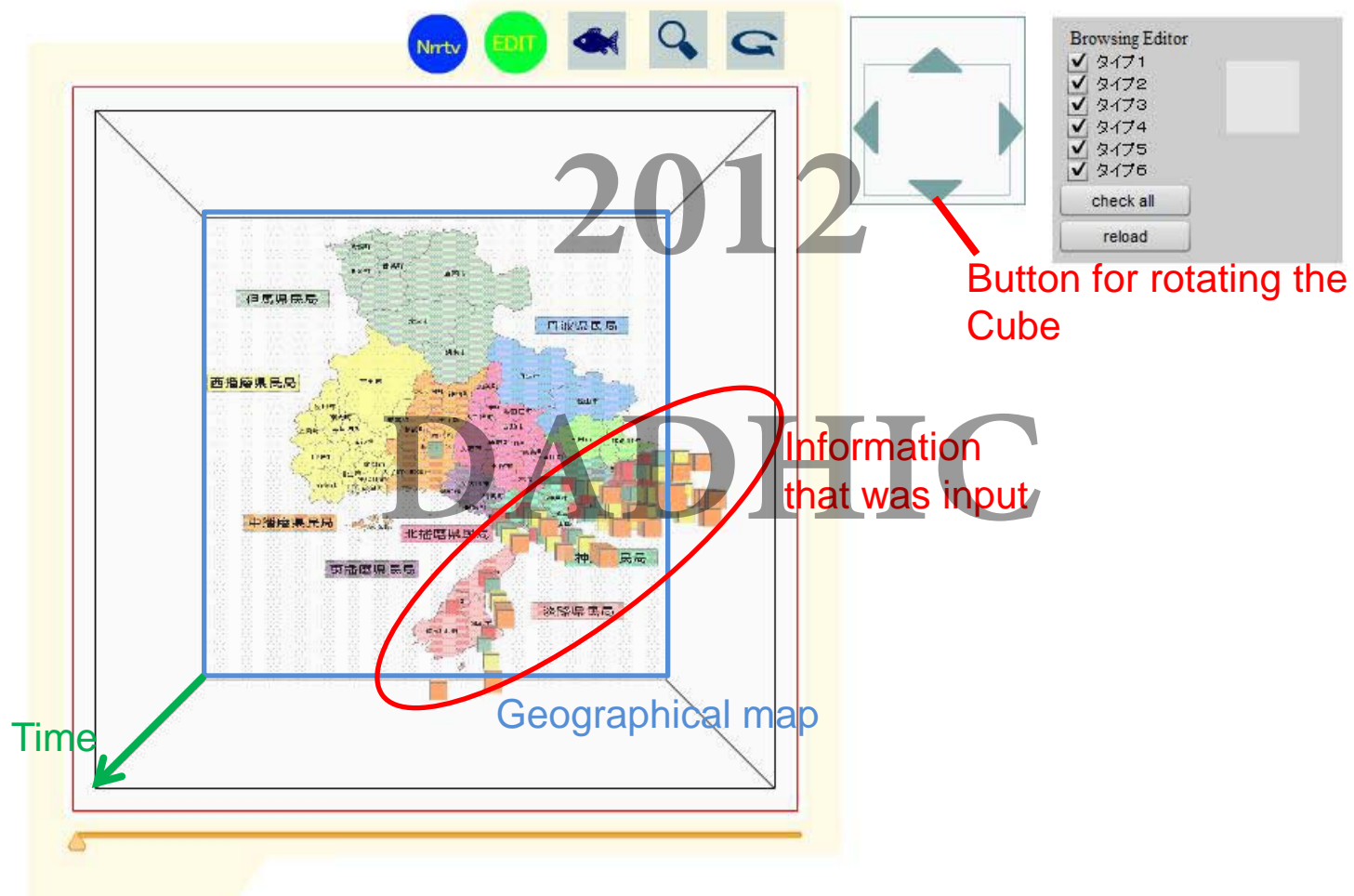


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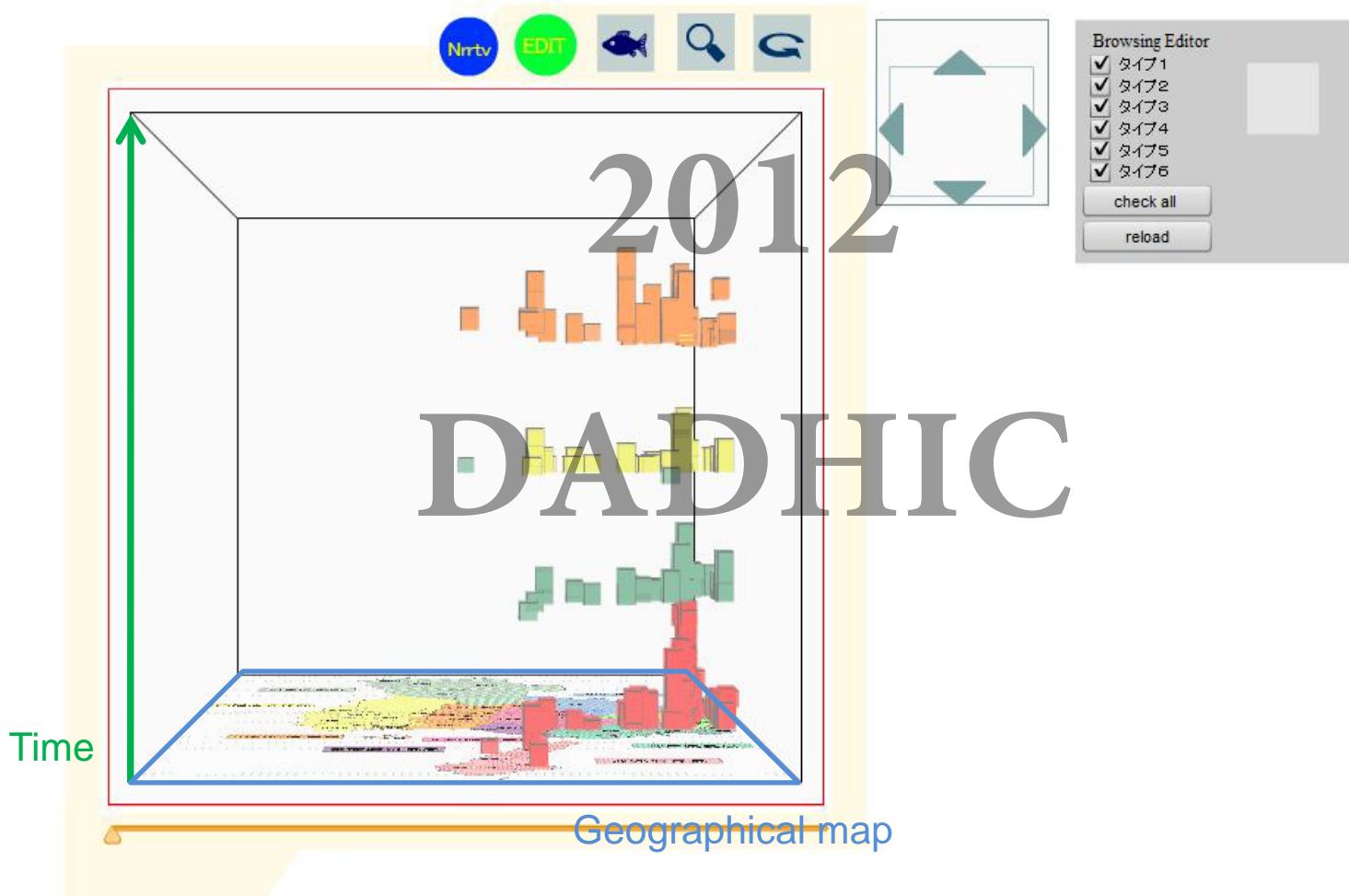


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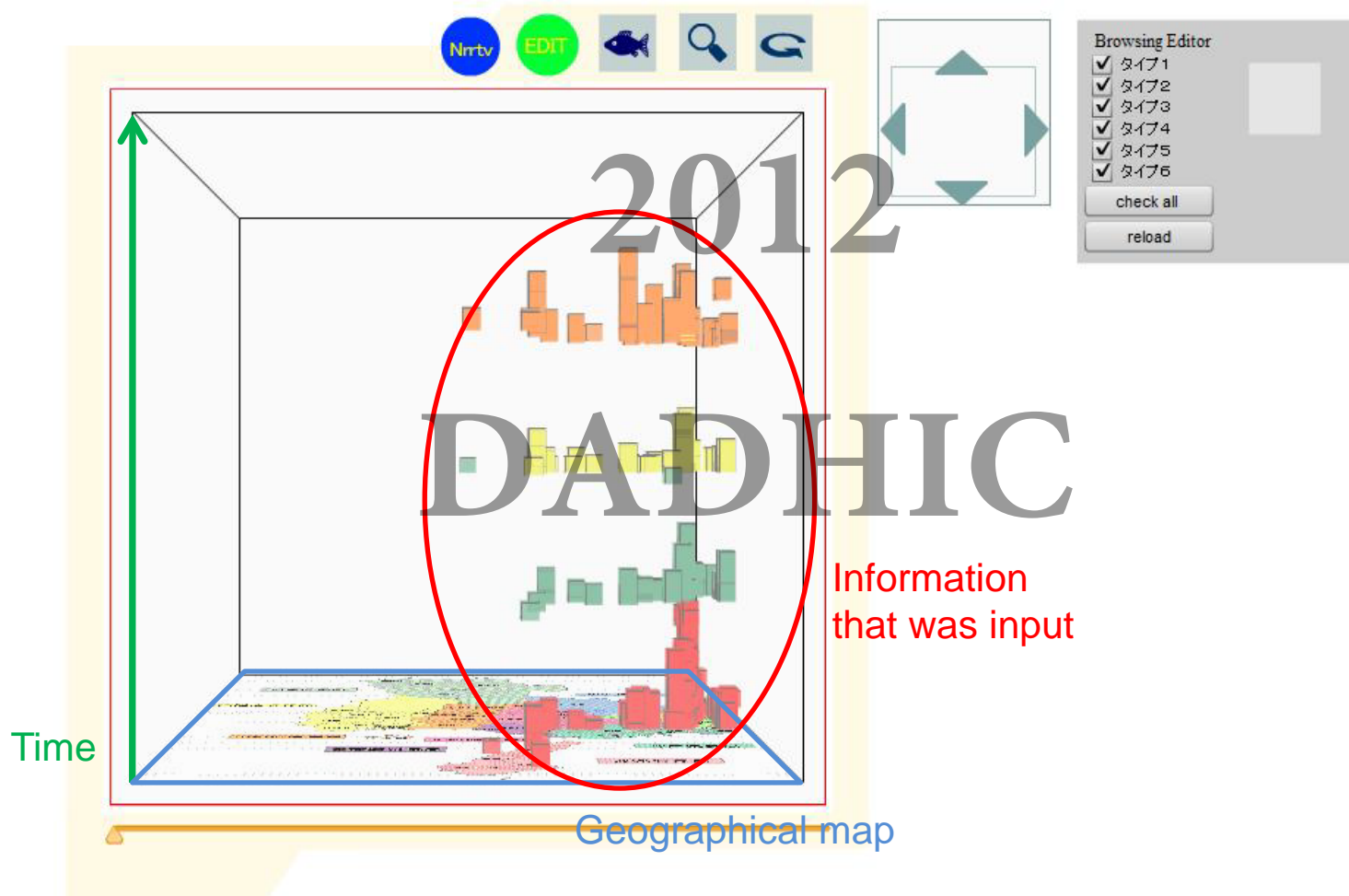


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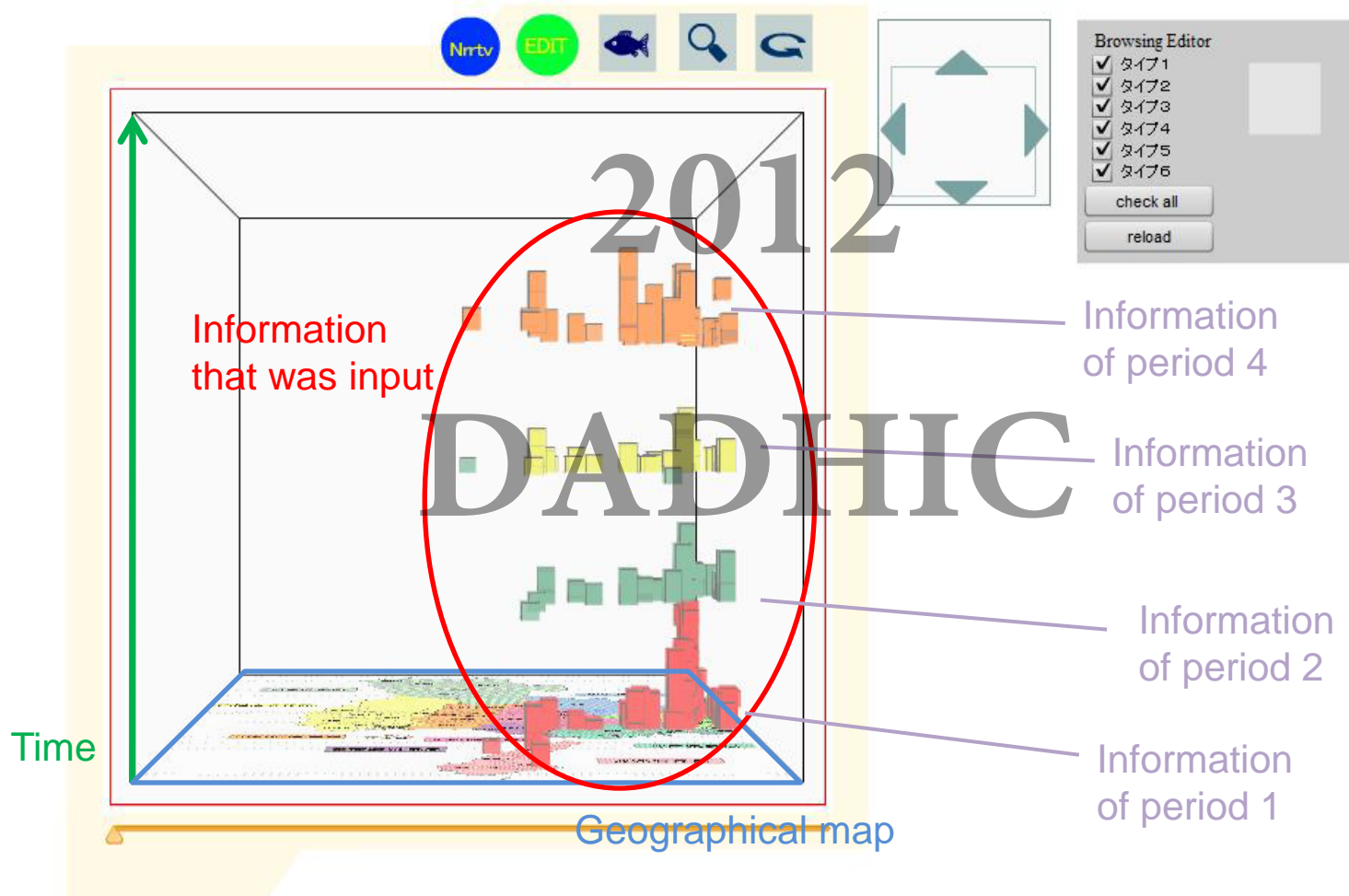


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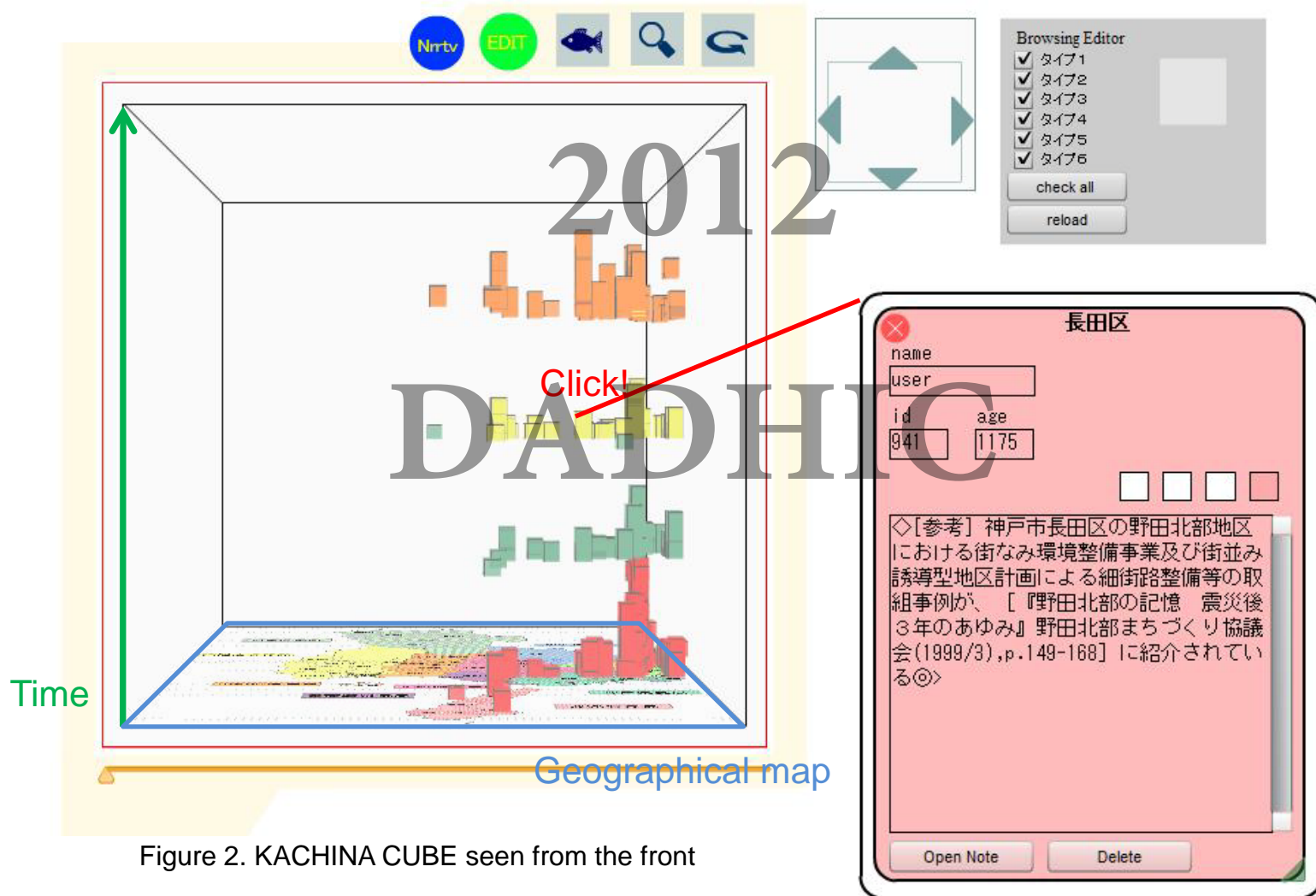


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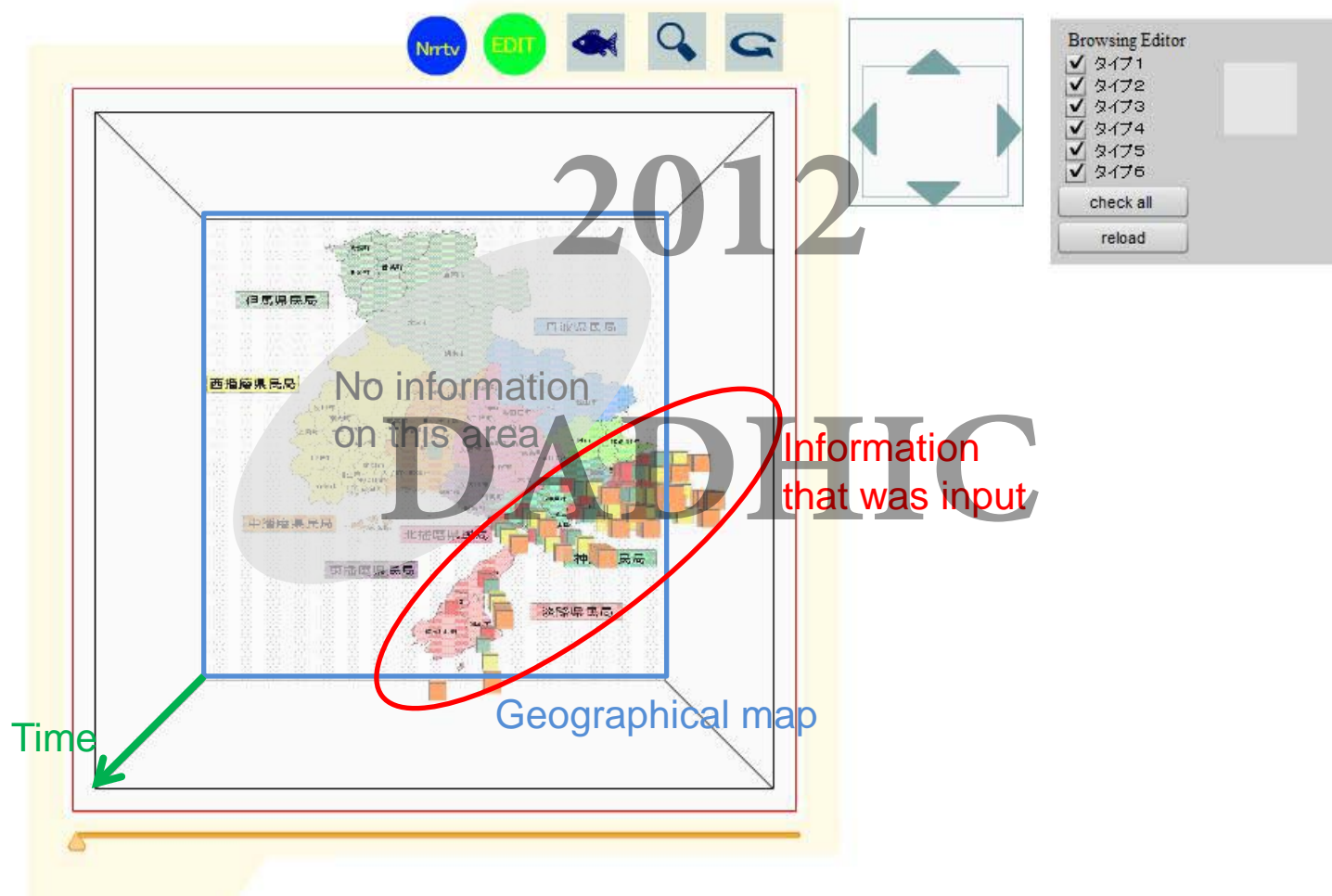


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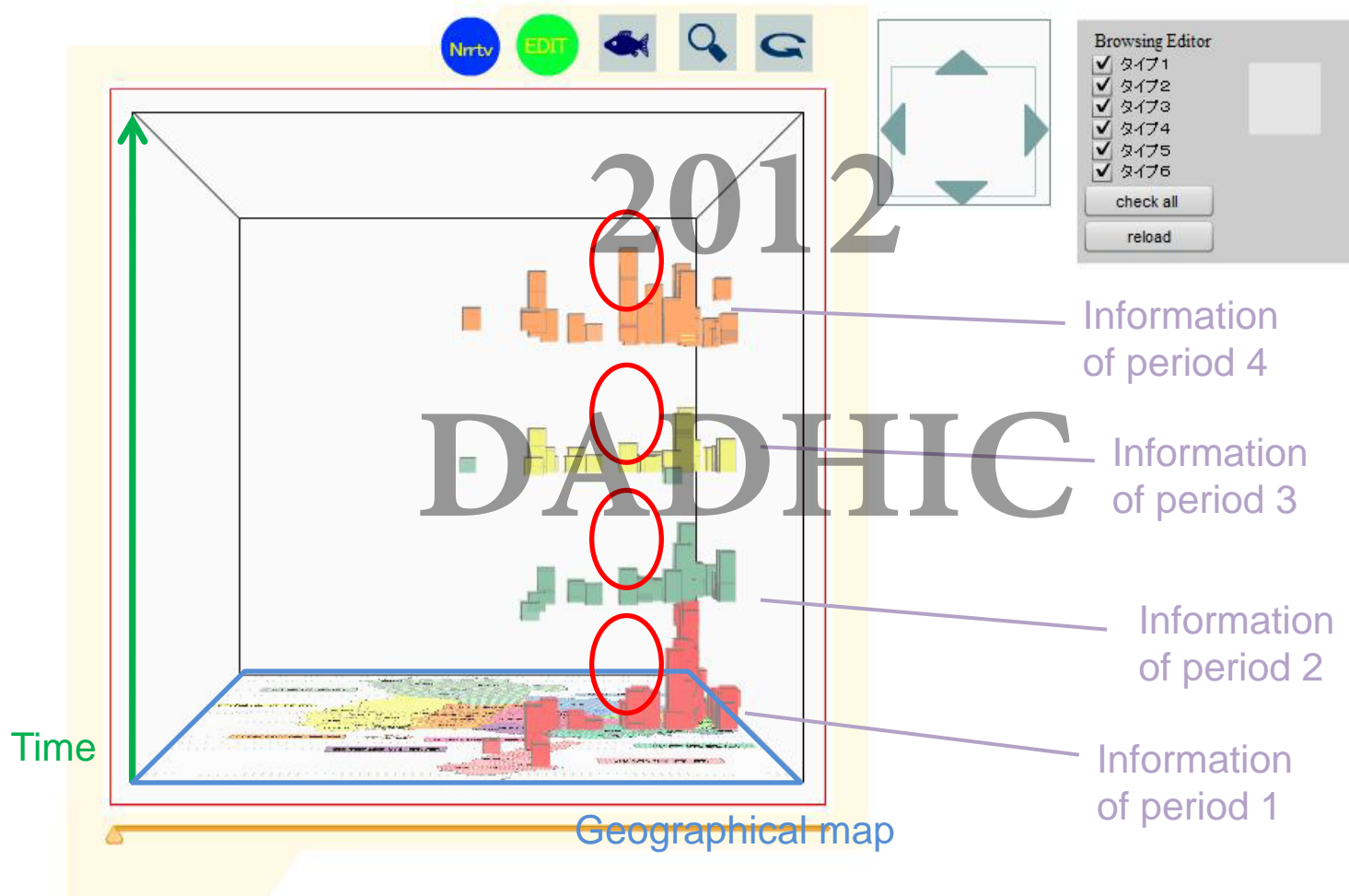


Figure 2. KACHINA CUBE seen from the front

4. Discussions **2012**

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4-1. Contributions of visualization

- Large amount of documents are at a glance on a cube.
- - Information is organized spatially and temporally.
- - We can see the transformation of the amounts of information over time on geographic map, with rotating the cube.

4-2. Problems of the visualization

- Only information including the name of municipalities (cities, towns and villages) is in the visualization.
- Many fragments of information gather at a geographic place.
- Various contents of information are mixed.

4-2. Problems of the visualization

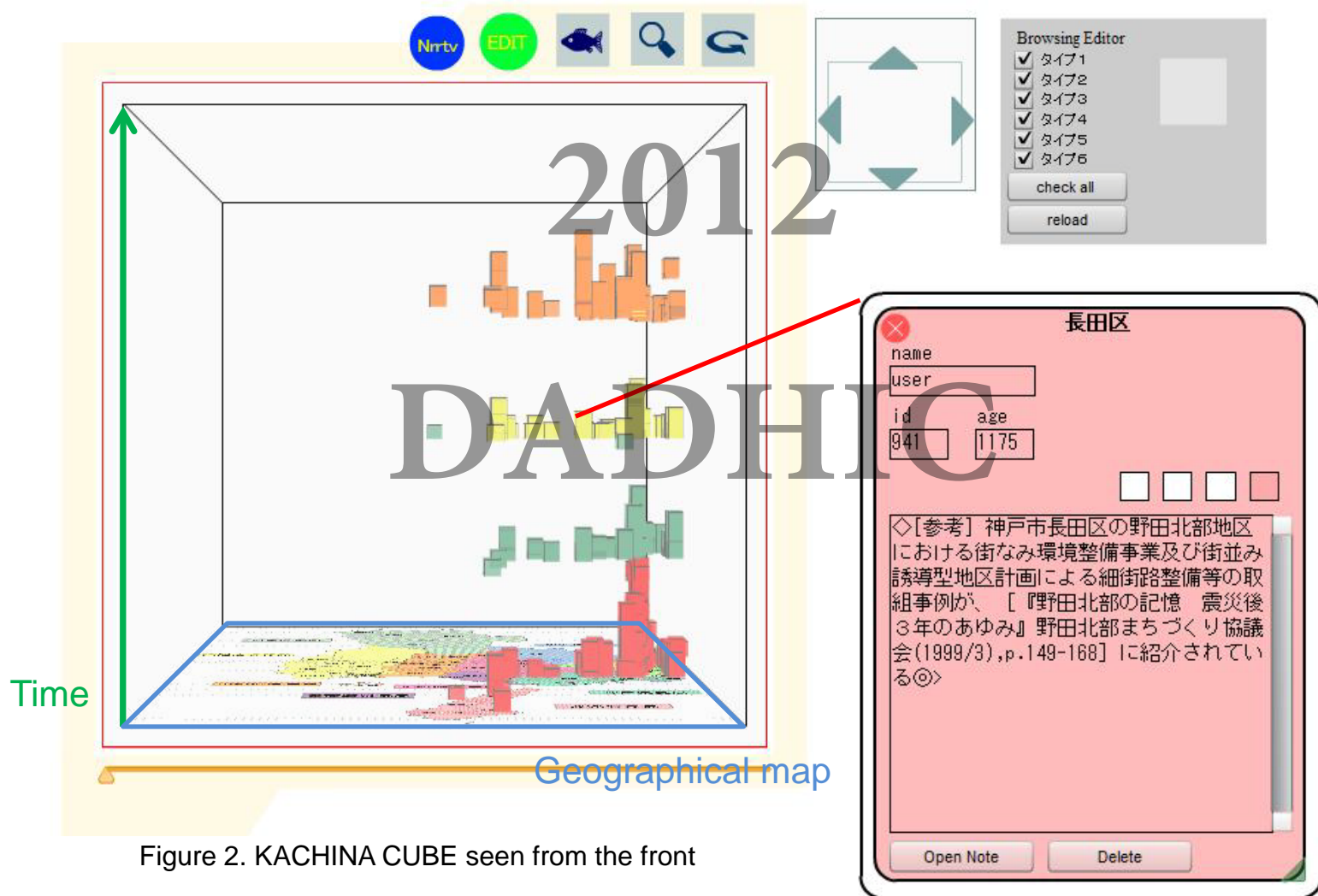


Figure 2. KACHINA CUBE seen from the front

4-3. For future studies

- Create or design the cube in that information is organized by the contents of each description of archive.

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5. Conclusion **2012**

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5-1. Conclusion

- Our visualization with the KACHINA CUBE system (having 2D geographical and temporal dimensions) triggered to learn more about what happened after earthquake hit.
- We could see the characteristics the information in archive.

- Thank you for the attention !

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