A Polymorphic Data Visualization for Spatiotemporal Database

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Outline of Presentation

- An Introduction to Reki-Show Authoring Tools
- Conceptual design of polymorphic data visualization
- Examples of Reki-Show Authoring
What is Reki-Show?

Reki - Show

- date, calendar
- symbol, phenomenon

Spatiotemporal Descriptive Information

Temporal Attribute
“When”

Spatial Attribute
“Where”

Observation of event
“Who did what”
“What became how”
Purpose of Our Project

To construct the **basic information tool** for recording various events, researching and analyzing social phenomena based on the conceptual model of **Reki-Show**.
Operability to handle spatiotemporal dataset

- Spatiotemporal database is not easy to use for almost every researchers and students in the field of social science.
- They don’t have efficient way to handle spatiotemporal dataset by using popular software (i.e. Microsoft Excel, Access, etc.) It is not impossible, but is annoying.
- Improving operability to handle spatiotemporal dataset is required.

Diagram:
- Spatiotemporal Database
  - Subject Dataset
  - Access
    - Intermediate Worksheets
    - GIS
      - Map
  - Excel
    - Intermediate Worksheets
    - Chart
      - Map
  - Reki-Show
    - Chart
Requirements for Reki-Show Authoring Tools

- Capability to visualize spatiotemporal multidimensional information
  - Usually, social science data is represented as spatiotemporal multidimensional information. The number of dimension vary by the field of concern.
  - To visualize spatiotemporal information by using legacy software, we have to reduce spatial information or temporal information. Because, legacy software are not fitted for multidimensional data visualization.
  - A tools designed for visualization of spatiotemporal multidimensional information is required.
A Solution: Polymorphic Data Visualization

- Spatiotemporal descriptive information
- Relationship of descriptive information
- Multidimensional Dataset
- Spatiotemporal statistical dataset
- Spatiotemporal categorized multi-attribute dataset
- Spatiotemporal observation dataset
System Overview

System Overview of Reki-Show Authoring Tools

- Reki-Show Server
- Shared Database (SQL2000 Server)
- Web Server
- Web Database Application
- CO-set Editor
- Crono-Matrix Viewer
- GIS Interface
- Geographic Information System (ILIAS)
- Local Database (JET)
- Data Inquiry
- Reki-Show Client (Windows Application)
- In-Campus User
- Out-Campus Network

Internet
Visualization of Peasant Riots in 18th~19th century of Japan

In the late of Edo-era (1840~1868), peasant riots occurred frequently in every part of Japan.

We categorized the cause of riot as follows:
- Market originated (unfair pricing, corner, etc.)
- Heavy tax
- Other reason

Also classified the level of violence as follows:
- Direct Appeal (non violent)
- Direct Appeal (violent)
- Escape
- Riot
- Uprising

Data source:
Data Visualization by Crono-Matrix Viewer

- TEN-MEI Famine, 1782-84
- TEN-PO Famine, 1832-38
- The end of EDO era, 1864-68

Level of violence

- Market originated
- Heavy tax
- Other reason

Spatial Distribution of Riots
Applied Example - 2

- Visualization of Yukichi Fukuzawa’s Logbook
  - Yukichi Fukuzawa (1935-1901) is one of famous enlightenment person in 19th century of Japan. He wrote a lot of books for young people and translated various western books. He also founded KEIO University.
  - Fukuzawa went a round trip to Europe in 1862 as a translator of embassy. He wrote a detailed logbook of the travel, “Seiko Nisshi”.
  - This logbook is a good example of Reki-Show Dataset; spatiotemporal descriptive information.
Major Milestones of Project

- Beta release of Reki-Show Authoring Tools by April, 2006.
  - Software will be downloaded from our Web site.
- Web Database Inquiry System will be released by April, 2006.
- Multilingual user interface should be supported by the end of 2006.
Thank you

Reference


URL

http://www.fcronos.gsec.keio.ac.jp/home.html