Developing the Digital Museum Using Various Images and Geographic Information Systems

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SPNHC & TDWG Joint Conference
-A hybrid conference
(3-5 September 2024, virtual poster)

Key words

Lake Biwa Museum Digital museum project

Digital Museums using Various Images (DMVI)

Digital Museums using Geographical Information Systems (DMGIS)

The aim of this project is to provide users with a new experience by making various digitally archived collection from Lake Biwa Museum available online and in the exhibition room.

3D and high-resolution images of various materials are made available on websites as databases for the Museum's collections, which can also be used for exhibitions.

In addition to distribution maps of specimens and survey data, maps from the past to the present can be superimposed to understand the changes in the habitats of living organisms.

Linking databases and web platforms via Application Programming Interface (API)

Information registered in the centrally managed LBM databases is reflected on each web platform through API integration.

Newly registered information is automatically updated, reducing the burden on database management.

LBM Databases

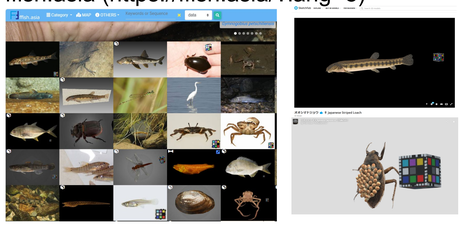
Linking databases and web platforms via API: Select the items to be published from the LBM Databases to the web platforms

Introduction

Digital archiving of museum collections, such museum specimens with 3D photogrammetry and occurrence data, is a global trend, but web platforms for archival data are not yet well developed. Many of the portal sites developed in Japan lack images and geographical information, making them difficult to use for non-specialists. Therefore, local museums, such as the Lake Biwa Museum, require web platforms that is easy to use for local users.

Precedent cases

ffish.asia (https://ffish.asia/?lang=e)

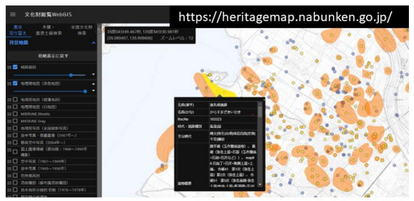


3D digital content using Sketchfab (https://sketchfab.com/)

○ 3D images can be scaled, rotated, and color coded.

○ The colorful specimens are reproduced in their fresh state, which is quite different from specimens that fade.

Nara National Research Institute for Cultural Properties



It is possible to search and display ruins by culture, type, etc.

○ The background map can be changed to see how the environment around the site has changed.

Cultural Assets Directory WebGIS
（https://heritagemap.nabunken.go.jp/）

Lake Biwa Museum (LBM) Digital museum project

This project will enable users to view the created 3D digital content and distribution maps of specimens and survey data on a website anytime, anywhere. It aims to generate interest in the exhibits, and to support ICT-based learning and enhance environmental learning.

● Digital Museums using Various Images (DMVI)
3D and high-resolution images of various materials are made available on websites as LBM databases, which can also be used for exhibitions.

On the website (Coming soon !!) | In the exhibition room | illustrated databases

● Digital Museums using Geographical Information Systems (DMGIS)
In addition to distribution maps of specimens and survey data, maps from the past to the present can be superimposed to understand the changes in the habitats of living organisms.

On the website (Coming soon !!) | Past map (1981-83) | Current Map | Details information

Future works

DMVI : We plan to create 3D models of animal footprint fossils and make them available on the web.

DMGIS : Enhancing DMGIS by adding registered information on new fields such as insects and folk tools to the map.

Fossil animal footprints

DMVI

A new experience of "touching" the real thing with 3D materials that can be rotated, enlarged, and reduced

Collections that were previously inaccessible can now be accessed online.

touchpad

In the exhibition room, visitors can operate the 3D models using a touchpad.

Creating a platform for web publishing

In addition, introducing a system for automatically photographing plant specimens at high speed

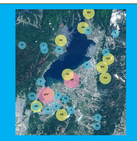
The 3D models developed by DMVI can be rotated, enlarged and reduced, providing a new experience as if you were holding a valuable material that you would not normally be able to touch.
By building an easy-to-use web platform, the project aims to develop the site as a ‘digital museum’.
The project is also developing illustrated databases limited to organisms inhabiting in Shiga Prefecture.

DMGIS

Change the map layers to learn about the environment at the time

① Search window:
Document name and local government (city/town)
② Data with the number of documents color-coded
③ Layered basemaps from different eras

Blank map



Current Map

It is possible to project a map showing the time period when the material was collected or discovered, making it easier to understand the conditions and environment in which the organisms lived at the time.

Search for organisms

Details information

Past map (1981-83)

Current Map

The easy-to-use illustrated search system DMGIS is promoting information on bird distributions and cross-disciplinary mapping. For example, specimens and observation data can be plotted and viewed on current maps, and changes in the distribution of birds can be followed along a time axis.
This content is intended for use in environmental education and nature conservation.