Digital techniques in every day business of university museum

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Chronology of our museum

1897  Foundation of Kyoto Imperial University
      (since then up to now around 2.5 million specimens accumulated)
1996  Recommendation for establishing university museums by the Science
      Council to the Ministry of Education.
1997  The Kyoto University Museum founded, covering various fields of
      human and natural science.
2001  Permanent exhibition opened for public.
Daily business of university museum

University museum is an organization with various and huge number of collection items (+ a few researchers)

- therefore three important businesses of university museum are:

1. (collecting,) preserving and maintaining valuable collections,
2. promoting the utilization of collections for research and education,
3. popularizing the scientific and educational activities of museum and university

I will talk about these missions and related digital techniques
Preserving and maintaining valuable collections

Preparation of botanical specimens
Preserving and maintaining valuable collections

Air conditioned storage rooms with ca. 2.5 million collection items
Digital cataloguing is essential for promoting the utilization of collections for research and education.
Our database should accommodate variety of collection items
KUMC-Database (digital technique 1a)

The Kyoto University Museum's Collection Database

NOMENCLATURE TABLE
nomenculture table

Species ID
latain name
author
japanese name etc.

related information table
present status of the species within the hieralcial system of nomenclature

Liable to change with the development of nomenclatural sciences

SPECIMEN TABLE

Specimen ID
Species ID
[Species ID2]
information table
date of registration
registrating person
revising person
identifying person confidential category
designation of holotype etc.

Entrance for the user

DETAILED INFORMATION TABLE

Specimen ID
histerisis table
sorce, collector, storage location, etc.

images table
photo ID, etc.

literature table
bibliographic information of the related reference

specimen specific table
original specimen ID!
geological formation name
evacuation site no.
etc.
Database (digital technique 1b)

Bar code for easy locating and re-shelving of items
Popularizing our museum

two reasons to do so:

- To get more support from citizens
- To bring up our successors
Popularizing our museum

Infrastructure and Activities

- Network system
- Permanent and temporal exhibition
- Popular lectures
- Developing learning programs
- Developing guide system (just started developing it!)
Museum’s network system (digital technique 2)
Main theme of the permanent exhibition: field science
Interactive game (digital technique 3)

Computer program for testing the intelligence of chimpanzee is installed in the exhibition room. You can compete with chimpanzee.
KUMC-database is also accessible for the normal citizens

Touch panel monitor in the exhibition room for database-searching
Real time seismological data sent through digital network are displayed at the entrance of our museum.
Popular lectures at Muse Lab.

Close encounter of scientists and citizens
A small theater in the museum's exhibition hall, a center for popularizing scientific activities of the university transmitting LECTURES on scientific tradition of the university on new discover by the university on new hypothesis by the university receiving LIVE IMAGES on university’s expeditions on current scientific missions of the university and other institutions
Museum and elementary education

Pupils are our potential customer!

Current issues
1. Too simplified curriculum
   • Less engagement with learning
2. Free Saturday for self-learning
   • without good guidance for self-learning
3. Introducing a new subject: “time of integrated learning”
   • Compelling synthesis without basic knowledge
4. Hypothesis - verifying style learning
   • Just like giving pupils with driver license without training

Our museum’s initiative for improving the situation
• Guided tours
• Lectures

And

Providing Science courses with attractive learning materials

Chaotic situation dominating in the elementary, secondary as well as in high Schools

(how you can be natural scientist?)
Giving children more motivation for learning based on natural history research: an analysis

Feeling of success in observing object, finding theme, postulating hypothesis, and then verifying it will motivate children to learn more and more including topics and objects of natural history.

Flow chart of Research

This makes you happy!
Learning program on trilobites

Successful verifying of their guesses gives children motivation for learning knowledge on insects.
Learning in progress
三葉虫を調べよう
Comparative anatomy of dinosaur and chicken
RFID-based guiding system (Digital technique 5)

- We have just started developing a RFID-based guiding system
- Giving supplementary information about permanent exhibition (we have no personals responsible for guided tours for visitors)
- Recommending the series of topics to see, according to the visitors interest (in future through real-time monitoring system installed in PDA of the preference of the visitor)
Suitable characteristics of RFID tag for using university museum exhibition:

- enough data capacity: 16 ~ 64kb
- relatively cheap
- once installed, functioning almost without maintenance

Top: RFID unit (receiver) (V705-HMF01)
Bottom: RFID tag (V700-D13P31)
(from Catalogue of the company Omron)
RFID: components

- RFID unit
- RFID-tag
- PDA with controlling software and guiding contents

RFID units can be located up to 20 mm away.
RFID-tag on a show-case
Guiding system in operation (image)

- With the supplementary information, visitors will be able to understand the exhibition more easily.
Guiding system: contents (image)

- Reconstructing fossils
- Collecting fossils
- Preparing botanical specimens
Possible usage of RFID system

Small learning program combined with exhibition

Answer: compound eyes!
You guess correctly!

What kind of eyes did trilobites have?
Guess!
**Possible usage of RFID system**

Monitoring facility installed in PDA gives suggestion for tour route

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Conclusions:

• (University) museums can provide researchers and students with interesting study objects and citizens with joy of learning.
• Especially through popularizing the museum and its researches, we may gain more support from citizens and may find talented successors.
• Digital techniques may provide us useful infrastructures for such activities of museums.
In cooperation with

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