基調講演 世界中のデジタルイメージを解き放つ IIIF入門：世界中のデジタルイメージを解き放つ 平成29年度 京都大学図書館機構講演会「デジタルアーカイブの新たな展開と可能性 - IIIFの動向と活用例から考える -」

Cramer, Tom; Keller, Michael; Rabun, Sheila; Snydman, Stu; Reed, Jack; Appleby, Mike

(2017)

http://hdl.handle.net/2433/227713

Kyoto University
Where did it come from?
UNITED NATIONS
ECONOMIC AND SOCIAL COUNCIL

PREPARATORY COMMITTEE

of the

INTERNATIONAL CONFERENCE ON TRADE AND EMPLOYMENT

Verbatim Report

of the

FIFTH MEETING

of

PROCEDURES SUB-COMMITTEE

of

COMMITTEE II

held at
Church House, Westminster, S.W.1.
on
Monday, 4th November, 1946
THE CHAIRMAN: I have been asked to make this announcement: In case delegates have not seen a notice which appeared in the Journal on Thursday, performances of the films "Henry V" and "Brief Encounter" are being given this afternoon and on Wednesday afternoon by the courtesy of the J.R. Rank Organisation Limited for members of Delegations and their staffs. Tickets can be obtained from Miss Cumyngham-Robertson, Room 511.

Now, I think that we were still discussing Article 8, paragraph 2, when we finished our last meeting, and I think we had reached the stage where it had been agreed that we could work on the existing draft of paragraph 2 of Article 8 in the United States Charter, and that it could be accepted subject to the deletion of reference to the dates there and the insertion of a phrase something to the following effect: "Elimination of any preference in the ordinary import customs duty which does not exceed a preference in force in any Member country on a date to be agreed between participating countries" - or words to that effect. I think it was suggested that the precise wording should be left for formal approval of the Committee after our newly-appointed Rapporteur had had an opportunity to examine the draft.

MR ALAMILLA (Cuba): It was arranged that both Mr Hawkins and myself would try, in the absence of the Rapporteur, to reach agreement on the wording,
International Image Interoperability Framework

Global

Image-based resources: books, images, newspapers, manuscripts, scrolls, maps, music, art, et al.

Mutually usable; simpatico

APIs Software Content Community
Images are fundamental information carriers for cultural heritage
But image delivery is...

...too hard
...too slow
...too idiosyncratic
...too disjointed
...too ugly

...and we all suffer because of it.
Deep zoom with large images
Cite and share (even regions of interest)
Computed Tomography (CT) scans of the head of a seal from the Wellcome Library
https://wellcomelibrary.org/item/b20433141 | https://wellcomelibrary.org/item/b2043313x
Across sites

Shakespeare-related resources from Oxford, Stanford & Yale

https://digital.bodleian.ox.ac.uk/inquire/p/32bb9aa4-43ce-4bf7-b0fb-c9452ca8e40c
Collect items that belong together

Le manuscrit 5 de la Bibliothèque municipale de Châteauroux, c. 1460

Folio in BVMM
Miniature in the BNF
Reunify

http://demos.biblissima-condorcet.fr/chateauroux/demo/
A world of silos & duplication

- Every site a silo (→ no interoperability)
- Every app a one-off (→ overhead to code and keep)
- Every user forced to cope (→ many UIs, little integration)
Grain elevators, Caldwell, Idaho, by Lee Russell, 1941.

http://www.loc.gov/pictures/resource/fsac.1a34206/
APIs enable reuse

- Export & Embed in 3rd Party Apps
  - Image Delivery
  - Description

- Customized App
  - Image Delivery
  - Search
  - Description

- Annotation Environments
  - Image Delivery
  - Transcriptions

APIs
  - RESTful Web Services

Repository
  - Canonical data store for images, descriptions, and more

Data Store
  - Images
  - MD
  - Annot.

Import & Export
  - 3rd party tools reuse content; mark up content with annotations which may enrich the original source.
APIs -> Framework -> Ecosystem
IIIF Vision

Create a global framework by which image-based resources (images, books, maps, scrolls, manuscripts, musical scores, etc.)

...from any participating institution can be delivered in a standard way

...via any compatible image server

...for display, manipulation and annotation in any application,

...to any user on the Web.
IIIF Vision, continued

• with tens of millions of image-based resources
• backed by a consortium of world-leading cultural heritage and research institutions
• supported by a rich and growing suite of software tools
• incorporating the best of current image delivery technology, and leveraging Web standards
IIIF dramatically reduces the friction of delivering image-based resources on the Web

- Bigger, better, faster, deeper, cheaper, more modular and more flexible
- Plug-and-play server and client software
- Publish once, reuse often
- Support for attribution and access control
IIIF creates radical new capabilities to do more than **view** resources

- Zoom, pan, interact, manipulate
- Compare, reunite, remix & mash up
- Cite and share
- Annotate
- Apply machine learning and AI
So What Is IIIF?
A Community that develops Shared APIs, implements them in Software, and exposes interoperable Content
A Community that develops Shared APIs, implements them in Software, and exposes interoperable Content
IIIIF is a community-driven framework
A Community that develops **Shared APIs**, implements them in **Software**, and exposes interoperable **Content**
IIIF: Two Core APIs

Image API
“get pixels” via a simple, RESTful, web service

Presentation API
Just enough metadata to drive a remote viewing experience
Image Delivery API

Order of Implementation

http://www.example.org/image-service/abcd1234/80,15,60,75/pct:80/345/grey.jpg

http://iiif.io/api/image/2.1/
Presentation API

- **Structure**
  - Collection, Item, Sequence, Parts

- **Properties**
  - Labels, description, license, attribution, links

http://iiif.io/api/presentation/2.1/
Hours of the Cross (ff. 21–35)
- Matins (ff. 21–23v)
- Prime (ff. 23–24v)
- Terce (ff. 25–26v)
  - f. 25: Flagellation
  - f. 25v.
  - f. 26v.
- Sext (ff. 27–28v)
- None (ff. 29–30v)
- Vespers (ff. 31–32v)
- Compline (ff. 33–35)
- Passion (ff. 35v–36v)
- Hours of the Holy Spirit (ff. 37–46v)
Image + Presentation = Object
IIIF: Three More APIs

**Search API**
Search within an object, such as the full text of a book or newspaper

**Authentication API**
To support login, and differential access to resources.

**A/V API**
Deliver time-based media (audio, video)
A Community that develops Shared APIs, implements them in Software, and exposes interoperable Content
IIIF Compatible Software

- Cantaloupe
  High-performance dynamic image server in Java
- go-iiif
- FSI
- IIP
- LORIS
- digilib
- MIRAR
- OpenSeadragon
- Luna Imaging
- Riiif
  gem version 1.7.0 coverage 93%
- uoregon-libraries / rais-image-server
- divajs
- Klokan Technologies
A Community that develops Shared APIs, implements them in Software, and exposes interoperable Content.
IIIF Content – Digital Images

• Example: Nichi-Man-Shi kanko sugoroku (Japan-Manchuria-China sight-seeing board game), from Princeton University
IllF Content - Texts

- Example: Illustrierter Sonntag (Der gerade Weg), 22.09.1929, from the Bavarian State Library
IIIF Content – Scientific Images

• Example: *Acacia* - *Fabaceae*, from the Natural Sciences Institute of the National University of Columbia
IIIF Content – Cultural Heritage

- Paintings
- Maps
- Manuscripts
- Photographs
- Scrolls
- Sculpture
- Sheet Music
- Any kind of image content
Scores of adopters
Dozens of applications
Millions of digital objects
Revolutionary promise
That’s great.

How do I use it?
IIIIF Viewers

Featuring the Universal Viewer
& Mirador
Universal Viewer = many formats
The biocrats

Gerald Leach
Universal Viewer Roadmap

• Adoption and support by
  – Digirati & Holoscene
  – Wellcome Library
  – National Library of Wales
  – British Library
  – Stanford University
  – Princeton University
  – Villanova University
  – National Library of Norway

• Future directions
  – Adoption of IIIF Presentation API v 3.0
  – Enhanced support for PDF, 3D objects, Office documents.
  – Improvements to UI, accessibility.
Mirador: 3 Primary Functions

Load

View

Annotate
How people are using Mirador...

- Viewing
- Comparison
- Annotation
- Transcription
- Unification
- Computational imaging
- Teaching
- Research
- Exhibits

- Embedded
- Stand Alone
- Scholars Workbench
Zoom and analyze images
Compare & Contrast
Santa Maria Rotonda (Pantheon)

Santa Maria Rotunda (Pantheon). Originally a pagan temple constructed during the reign of Emperor Hadrian, the Pantheon was converted into a church and dedicated to the Virgin Mary at the beginning of the seventh century. The building served as a site for inspiration and occasional work by members of the Accademia.

More information
CellXplorer is an interactive and annotated graphic that you can navigate. You can click on the buttons below to zoom in. As each week's content becomes available, you can also navigate to the lesson associated with that part of the cell! The graphic below can sometimes take some time to load.
Analyze layers

Vermeer’s Girl with the Red Hat, from the National Gallery of Art (US)
Right-to-left reading
(thanks to Kiyonori Nagasaki!)
Mirador Desktop
Mirador Github Activity Worldwide

http://jrvis.com/red-dwarf/?user=projectmirador&repo=mirador
In a Nutshell, mirador...

... has had 1,777 commits made by 45 contributors representing 63,941 lines of code.

... is mostly written in JavaScript with an average number of source code comments.

has a young, but established codebase maintained by a very large development team with stable Y-O-Y commits.

... took an estimated 16 years of effort (COCOMO model) starting with its first commit in April, 2014 ending with its most recent commit 6 months ago.

https://www.openhub.net/p/mirador

- Stanford
- Harvard
- National Gallery of Art
- Yale University
- UCLA
- BnF/Bibliissima
- BSB
- University of Tokyo
- University of Toronto
- St. Louis University
- The Frick
- Johns Hopkins
- Hill Museum & MS Lib
- Sirma
- Et al.
Mirador Roadmap

• Mirador 3 planning
  – Major UX and visual redesign
  – Major upgrade to technical underpinnings
    • Easier to customize
    • Easier to integrate into other applications
  – Better documentation and tests
  – Desktop and mobile versions
Try It and Get Involved

http://projectmirador.org/

http://github.com/projectmirador

https://github.com/ProjectMirador/mirador-desktop

mirador-tech@googlegroups.com
Leaflet-IIIIF
and integration
in other applications

Jack Reed | @mejackreed
https://github.com/mejackreed/Leaflet-IIIIF
What is Leaflet-IIIF?

• Leaflet-IIIF is JavaScript plugin for the interactive map library Leaflet
• It allows you to create performant interactive images using IIIF Image API endpoint
Leaflet-IIIIF - Basic example

https://bl.ocks.org/mejackreed/b0aba2ff6f5a54f197767313fbc5a26ebit.ly/leaflet-iiif-basic
So what is so special about Leaflet?

“Leaflet is designed with simplicity, performance and usability in mind.”

- leafletjs.com
• > 530 contributors
• Very lightweight < 40Kb
• Chrome, Firefox, Safari +5, Opera +12, IE 7-11 Support
• Excellent mobile support
• Accessibility
• Object-oriented programming principles
• No external dependencies
But the big advantage...

Plugin architecture with over

400 plugins
Digital Typhoon: Himawari-8

http://codh.rois.ac.jp/software/iiif-curation-viewer/
http://agora.ex.nii.ac.jp/digital-typhoon/himawari-3g/clipping/index.html.en
Leaflet-IIIIF – Layering

https://bl.ocks.org/mejackreed/a0caf223c4f0d5111b2c4973d0402e69
Cropping images using Leaflet-IIIIF

https://bl.ocks.org/mejackreed/6936585f435b60aa9451ae2bc1c199f2
Cropped images being used in other applications

The Bob Fitch Photography Archive
Movements for Change

Martin Luther King, Jr.
Gallery
Trained to be a Protestant minister, Bob Fitch's career as a photojournalist began in 1965 when he joined the Rev. Martin Luther King Jr.'s organization, the Southern Christian Leadership Conference, as a staff photographer. As Fitch notes, "I worked for two intense years as the volunteer photographer for Dr. King and the SCLC, crisscrossing "Black Belt" states to document his people-to-people speaking tours promoting get-out-the-vote campaigns."

https://exhibits.stanford.edu/fitch
https://github.com/projectblacklight/spotlight
PolyAnno

Machine learning, computer vision, and IIIF

• IIIF image content is ripe to develop machine learning and computer vision applications
  – Web native API’s provide a consistent way to access images (and parts of images)
  – IIIF speaks annotations out of the box, useful for classification and shape detection
  – Provides an interoperability opportunity for image processing collaboration
Histonets – Computer vision and machine learning with IIIF

https://github.com/sul-cidr/histonets
Select a Collection

Default Collection ▼ Next Step

https://github.com/sul-cidr/histonets
Review Template Match Results

Drop to Load Manifest
IIIF APIs
& Demonstrations

Michael Appleby
Head of Information Technology
Yale Center for British Art
@mikeapps
Image API

region=125,15,120,140 size=90, rotation=345 quality=gray
.../125,15,120,140/90,/345/gray.jpg
Victoria & Albert Museum Compariscope: Constable’s Hadley Castle

Hadley Castle, near Southend

Species: painting

Phases of Hadley Castle

1. Front view of Hadley Castle
2. Side view of Hadley Castle
3. Detail of Hadley Castle

Credit Line: Yale Center for British Art, Paul Mellon Collection

Additional Information:

- Date: 1779-1807
- Medium: Oil on canvas
- Dimensions: 48 1/4 x 52 1/4 inches (122.6 x 133.2 cm)
- Frame: 51 1/4 x 55 1/4 inches (130.2 x 139.9 cm)

- Description:
  - Hadley Castle, near Southend
  - John Constable, 1779-1807
  - A pencil drawing of Hadley Castle
  - Physical description:
    - Image from a sketch book.
    - Pencil drawing of Hadley Castle.
  - Piece of Origin:
    - England (region)
    - Houses and Stables
    - Hadley Castle

- Restrictions:
  - Free for personal, non-commercial use
  - Must credit Yale Center for British Art

- License:
  - Creative Commons Attribution-NonCommercial 4.0 International License

- Keywords:
  - England
  - Houses and Stables
  - Hadley Castle
  - John Constable
  - Pencil drawing
  - Victorian architecture
  - Landscape

- Related Collections:
  - Yale Center for British Art, Paul Mellon Collection
  - Victoria & Albert Museum
In preparation for the V&A’s 2014 major exhibition, 'Constable: Making of a Master' a number of the Museum’s oil sketches by John Constable were remounted and reframed. The process revealed many surprising discoveries, including a previously unrecorded work, hidden by an old canvas lining.
“The objective of the IIIF Presentation API is to provide the information necessary to allow a rich, online viewing environment for primarily image-based objects to be presented to a human user, likely in conjunction with the IIIF Image API.”
The IIIF Manifest contains the data necessary to represent an object.

“**Manifest:** The overall description of the structure and properties of the digital representation of an object. It carries information needed for the viewer to present the digitized content to the user, such as a title and other descriptive information about the object or the intellectual work that it conveys. Each manifest describes how to present a single object such as a book, a photograph, or a statue.”
A Canvas is a coordinate space with X and Y dimensions (width and height).

Images are associated with the Canvas via Open Annotation. (In Presentation API 3.0, W3C Web Annotations will be used.)
A Manifest contains one or more Sequences.

Each Sequence contains an ordered list of Canvases.
Presentation API: Other Properties

• Descriptive Properties (label, metadata, description, thumbnail)
• Rights and Licensing Properties (attribution, license, logo)
• Technical Properties (viewing direction, viewing hints, width, height, ...)
• Linking Properties (related, see also, start canvas, within, ...)
• Paging Properties (first, last, next, total)
Audio-Visual

- IIIF Presentation API 3.0 will expand the notion of a Canvas from an x,y space by adding a time dimension
- This will allow for annotation of audio and video onto the Canvas at specific points in time
- Images, text, and other content can also be annotated on to the Canvas
- The video on the following slide shows the combination of video, still images, and text, all annotated on to a single canvas.
Presentation API: Reconstruction of a Manuscript Folio
Demonstration: Manuscript Reconstruction
Multiple Images on a Single Canvas
Demonstration: Multispectral Images
Demonstration: X-Ray and Conventional Photography

Sir Joshua Reynolds RA, 1723–1792, British, Mrs. Abington as Miss Prue in "Love for Love" by William Congreve, 177...
Demonstration: Detail Images and Deep Zoom

Detail image width: 5284 pixels

Base image width: 6258 pixels
Demonstration: Detail Images and Deep Zoom
IIIF – Get Involved
How to Participate

1. Use IIIF-compatible software and content
2. Expose your collections via IIIF
3. Make your software IIIF-compatible
4. Ask your software suppliers to become IIIF-compatible
5. Join IIIF communication channels - #japan on Slack
6. Sign up for IIIF-C
IIIF Communication Channels

- IIIF Website: http://iiif.io
- iiif-discuss@googlegroups.com
- Twitter: @iiif_io and #IIIF
- Awesome-IIIF on Github
- IIIF YouTube Channel
- IIIF Events
- Contact me: srabun@iiif.io
Communication

IIIF-Discuss Google Group

IIIF Slack

Total Messages

https://groups.google.com/forum/#!forum/iiif-discuss

#japan in IIIF Slack

**knagasaki** 7:40 AM 🌟

日本文化コンテンツを含む海外のIIIF対応サイトをリストを共有しておきたいですね。今把握している範囲では、フランス国立図書館 gallica ヴァチカン図書館 プリティッシュ・コロンビア大学図書館 スミソニアン協会図書館 といったところですが、ハーバードも持っているような気がします。（ハーバードのはまだ中国のものしか把握できていません）

**takaxp (Takaaki Ishikawa)** 7:50 AM

本チャンネルを作ろうとの議論において、iiif.jp に Slack（及びこのチャネル）への Instruction があれば、国内の皆様が幸せになれそうとの意見がでされておりました。Twitter であれば、固定ツイートに設定しておけば、目立つ状態を維持できそうです。
IIIF Community Newsletter

• Learn about current activities – http://iiif.io/news
2018 IIIF Conference in Washington, DC

- May 21-25, 2018
- Co-hosted by the Library of Congress, Smithsonian Institution, and Folger Shakespeare Library
IIIF Consortium

- [http://iiif.io/community/consortium](http://iiif.io/community/consortium)
- 47 institutional members
- Sustainability and steering for IIIF
- Additional Founding Members – through 2017
- Leading a revolution in digital access

*Please consider joining!*
IIIF-C Founding Members to Date

- Artstor
- Bavarian State Library (BSB)
- British Library
- Brown University
- Cambridge
- Chinese U. of Hong Kong
- Cornell
- Data Futures
- Ecole Polytechnique Federale de Lausanne (EPFL)
- Europeana
- Folger Library
- J. Paul Getty Trust
- Johns Hopkins
- Harvard University
- Hong Kong University
- Indiana University
- Kyoto University Library Network
- MIT
- National Gallery of Art (US)
- National Library of France
- National Library of Israel
- National Library of Norway
- National Library of Poland
- National Library of Scotland
- New York University
- North Carolina State University
- Ohio State University
- Oxford
- Penn State University
- Princeton
- Saint Louis University
- Smithsonian Institution
- Stanford
- University of Basel
- University of Edinburgh
- University of Göttingen
- University of Leiden
- University of Michigan
- University of Notre Dame
- University of Pennsylvania
- University of Tokyo
- University of Toronto
- Vatican Library
- Wellcome Library
- Yale University
  (incl. Yale Center for British Art)