

Managing Images of Ancient Documents

Requirements elaborated by a TIGLIO Project working group

Tufts University, 5-6 November 2015

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Requirements list

This list of requirements has been developed during meetings of the TIGLIO project in Bari (IT) and in Boston (MA) to describe in a prioritized list the requirements for a future common management of images of ancient documents as inscriptions, papyri, manuscripts.

There are numerous solutions for various kinds of tasks already available, and there is not a general need for a single centralized tool to accomplish this task, as much as for a coordinated series of practices to maximize the possibilities of each project and the resources made available by institutions.

The participants in the meeting have decided upon a series of desiderata, have discussed a series of user stories and user cases and then summarized them in this general list of requirements to benefit future projects by recommending items to prioritize and tasks to be carried out to meet such needs.

Solutions proposed aim at being simple, and have as little preconditions as possible, so that it should be easy for the one time editor as for the sector professional to collaborate in the wider panorama of digital scholarship rather than just contributing to one or the other project.

Generally we all agree that the ideal way to integrate resources is to work with linked data annotations and to have as much as possible images exposed online in a nice way.

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6.4 Guide people in what best practices there are and they could use

1. Creating images, media

ID	1.1
Goal	Create images for archival purposes
Main actor(s)	publisher, archives, institutions
Short description	Whoever first has an occasion to produce a digital representation at a given level of quality, should be able to do that, and should already know where the images, scans or other media he has produces can be usefully stored.
Preconditions	Means for digitization are nowadays common. Limitations due to policies should be made easier to allow freedom of reproduction of ancient documents.
Basic flow	A user makes any image which could be used for research and stores it somewhere, giving it relevant identifiers and minimal metadata.
Alternate flow	Institutions holding ancient documents expose their images with multiple community driven frameworks and also use relevant identifiers and annotations with relevant metadata.
Priority	High
Status	In progress

2. Connecting images transcriptions, translations

ID	2.1
Goal	Identify Images
Main actor(s)	publisher, archiving institution
Short description	Give stable URIs to images, 3d models, videos, OCR, scans so that they are retrievable and searchable and connected to one another. We should all be able to refer univocally to a photo and use one copy stored in a distributed accessible repository as wanted. Annotations could then clearly describe the relationships between resources. Identifiers should be inferable from contents, or resolvable from alternatives, so that they can be assigned by anyone without looking them up in a list which would be impossible to produce and maintain.
Preconditions	A separate service should provide persistent identifier. Images archived in a server which can handle CRUD requests should have the ID assigned by the server.

Basic flow	Typically the archiving institution would assign an id. <ol style="list-style-type: none"> 1. The images is placed into an archive 2. A service mints an identifier 3. A service resolves the identifier to a resource most times 2 and 3 are combined but not necessarily, The images have an id, the server where they are is known
Alternate flow	The image is uploaded and automatically given an id
Priority	High
Status	This happens for most images in institutional repositories

ID	2.2
Goal	Identify content of images, connect images
Main actor(s)	Author, publisher
Short description	give stable identifiers to text represented in images of Ancient Documents so that the image can be linked to the relevant text, by either associating it to the core metadata or adding an annotation to the object. Identifiers should be inferable from contents, or resolvable from alternatives, so that they can be assigned by anyone without looking them up in a list which would be impossible to produce and maintain.
Preconditions	Archived images exposed online with a stable identifier. Annotations are stored in third place. The Integrating Digital Epigraphy Service would provide both these services for inscriptions and papyri. Open Annotation should be used to build the annotation statements.
Basic flow	Distributed Text Service identifiers for the text represented, down to the relevant chunk represented on the image would be added and called to identify text, part of texts down to the relevant level. IDEs keeps this URIs and the ids, resolves them and thus gives guarantee of the stability of the system.
Alternate flow	
Priority	High
Status	Needed

ID	2.3
Goal	Store the annotations
Main actor(s)	Service
Short description	Any annotation on images of text is known and stored in a repo which maintains the graph
Preconditions	There are identifiers and annotations

Basic flow	The archival institution produces annotations in the required format and publishes them, the service institution knows about that and either copies or connect that annotation to the others
Alternate flow	The author of an edition produces alignments of a text to an images stored in distributed repo and sends these as annotations to the service repo
Priority	High
Status	Needed

ID	2.4
Goal	Maintain the connection of annotations as things change
Main actor(s)	Service
Short description	Possibly Temporary reference in a pre publication state do not need to be updated to new standards but the service resolves alternatives and deals with changes once for everyone.
Preconditions	There are annotation and stable identifiers.
Basic flow	A URI is assigned but the convention change because of new consideration to the scheme. The service maps the changes so that references remain valid.
Alternate flow	
Priority	High
Status	Needed

ID	2.5
Goal	Add annotations to images
Main actor(s)	Editor, Publisher
Short description	Publish annotations of images, add informations of any kind
Preconditions	Identifiers, annotations stored somewhere
Basic flow	The user access an image, has an annotation editor and enters data into the editor which is stored where relevant. The user finds an image online and wants to add an annotation, launches an app which builds the annotation and sends it to the annotations repo.
Alternate flow	The user makes an annotation and stores it with the others
Priority	Medium

Status	Examples of such tools are Pundit (http://thepund.it/) and Hypothes.is which aim at integration at browser level.
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ID	2.6
Goal	View annotations
Main actor(s)	Annotation Service
Short description	Enable to view the annotation in whatever medium
Preconditions	Storage of annotations, identifiers
Basic flow	The storage of the annotation has a viewer and plugins to visualize the content in other applications.
Alternate flow	The annotation is published in such a way that it can be consumed by any client. Sometimes a view of the graph to understand the structure, another view is the presentation of the graph (picture next to transcription) using the graph. The user should be able to read the data he has just posted and edit it.
Priority	Low
Status	Needed

ID	2.7
Goal	Access and modify annotations
Main actor(s)	Editor publisher
Short description	Access and modify all annotations of images, not just the ones made by the actor. Multiple input points for annotation to one text (from mirador or from another editor).
Preconditions	Identifiers, annotations maintenance
Basic flow	The user access all relevant annotations from the service and edits them because there is a mistake or more info to be added. The history of changes to this annotation is kept as well.
Alternate flow	The user modifies his annotations locally and uploads the modifications to the common annotations repo.
Priority	Low
Status	Needed

ID	2.8
Goal	Make annotations in different purpose built environments

Main actor(s)	Researcher, occasional users
Short description	The user is able to add annotations to images with semantic tags wherever they are displayed or used.
Preconditions	Storage of annotations, identifiers, annotations editors and plugins
Basic flow	The user goes to an editor which looks at the annotation store and is guided to make a series of possible edits or can add entire sets of annotations to the store directly.
Alternate flow	The user access a general purpose annotation editor and is able to select where to store his annotations
Priority	Low
Status	Needed

ID	2.9
Goal	Annotate text with images
Main actor(s)	Editor, publisher
Short description	Annotate text with images, at various conceptual chunks different chunks, like fragments , logical units, lines, whichever the logical unit is that is relevant to the annotation
Preconditions	Identifiers, structure for identifiers and references (IIIF), connection image to text, editor environment. Mapping CITE to IIIF and move images to a IIIF repo the images.
Basic flow	A user accesses data available in Perseids and adds references to portions of an image in a xml file
Alternate flow	A user enters manually references to images in an xml file
Priority	Low
Status	Perseids provides a nice tool to do this, which integrates also board revision. Other tools exist.

ID	2.10
Goal	Annotate images located anywhere
Main actor(s)	Editor, open repositories, publisher
Short description	For example annotate images on flickr or Wikimedia Commons
Preconditions	Wikimedia Commons and Flickr adhere to standards of images exposition and representation; identifiers; structure for identifiers; connection image to text.

Basic flow	The user finds an image, a tool identifies its provenance as it is visualized from an IIIF archive. Given the URI of the image the user is then able to add an annotation to the image. One example for this would be images in Wikimedia Commons widely used online. Templates in Commons could be modified to insert uris and bots could be written to regularly update annotations about photos from the metadata added.
Alternate flow	If an open IIIF compliant archive for images exists and the researcher wants to publish and use his photos online he could do this directly using such repo instead of seeking institutional backing.
Priority	High
Status	Needed Wikimedia Commons could serve well this but is not yet IIIF compliant. https://phabricator.wikimedia.org/T89552

ID	2.11
Goal	Distinguish general types of photos
Main actor(s)	Archive, Publisher
Short description	Distinguish images of an object from images which are primarily of a text. Distinguish types of photos of a document. Distinguish the intentions of each representation
Preconditions	The image has an identifier and is connected to a text with an identifier
Basic flow	An annotation is written which declares the type of content of the image
Alternate flow	The basic metadata of the image contain a tag or a structured description of the contents
Priority	Medium
Status	Needed

3. Sharing images, making them accessible

ID	3.1
Goal	Upload images - store and preserve media
Main actor(s)	Archives, Authors, Editors
Short description	Upload images to a repository, get persistent identifiers for them, and assign metadata which associates the images with texts (manuscripts, inscriptions, etc.) identified by persistent identifiers (such as CTS)

Preconditions	Server, identifiers, minimal compulsory metadata on contents to go with the image upload.
Basic flow	The user has an image of a document, he goes to an archive or server and uploads the image there. The server assigns an id and the user happily reuses the images.
Alternate flow	A general purpose uploader lets the user decide among several archives which accept submissions from it.
Priority	High
Status	It is possible to upload images to several online archives as Wikimedia Commons, Flickr, etc.

ID	3.2
Goal	Record history of changes
Main actor(s)	Archive
Short description	Each change to an image online or to the annotations attached to it should be recorded.
Preconditions	There is an image somewhere online
Basic flow	The metadata of the image are changed, a record of this is created.
Alternate flow	
Priority	High
Status	Open Archives of images as Wikimedia Commons provide this service

ID	3.3
Goal	Have an alternative to libraries to host images
Main actor(s)	Independent archive, Open Institution
Short description	Researchers who cannot upload images to library archives will be able to give the images to such service and retrieve them without setting up their own server and paying it.
Preconditions	Somebody has space, money and the intention to do this in a good way.
Basic flow	A user has domain specific images to upload and no institutional backing to do so. He knows about this archive and uploads his images there.
Alternate flow	An archive loosing project funded backing to store images can move files to this archive for long term preservation
Priority	High

Status	Needed
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ID	3.4
Goal	Guarantee the presence of metadata with images
Main actor(s)	Archives, Authors
Short description	Upload tools and requisites for the data attached to images in archives should require minimal metadata.
Preconditions	Archive
Basic flow	
Alternate flow	
Priority	Low
Status	Largely implemented

ID	3.5
Goal	Facilitate users to find a place to archive the images
Main actor(s)	Archives, Libraries, Institutional repositories
Short description	Users need to know where they can store their domain relevant images and what are the differences between the available options. They need to know also how they can set up their own server.
Preconditions	identify an institution and the resources needed to maintain it
Basic flow	If user have an affiliation, then there should be an institutional repository, although this is not always the case.
Alternate flow	Set up your own server to archive the images
Priority	Medium
Status	Needed

ID	3.6
Goal	Upload metadata about contents along images
Main actor(s)	Archives
Short description	While the user uploads an image to a server he publishes also relevant annotations with identifiers of the image, the text represented and other informations relevant to the use of the image (provenance, author of the photo, etc.)
Preconditions	There is an accepting archive and there are known metadata about the photo and the text represented,

Basic flow	During upload the user can associate metadata from different sources to his images.
Alternate flow	Others associate metadata to existing domain specific images, knowing that this metadata are missing.
Priority	High
Status	Needed

ID	3.7
Goal	During Upload add relevant annotations
Main actor(s)	Author, archive
Short description	The user needs an easy way to annotate the image with connections to relevant information, e.g. to place of provenance or author, (Pelagios, Vial, etc.) the Upload phase should propose these contents and integrate a look up function to enter the relevant data.
Preconditions	There are identifiers, a given number of info I want to add
Basic flow	The user uploads the photo and is asked about some basic informations about the documents. He enters such information which is already linked to relevant resources where possible (places, authors id e.g.), picking it from a list which does look up on typing of the information.
Alternate flow	
Priority	High
Status	Needed

ID	3.8
Goal	Batch upload
Main actor(s)	Archive, editor publisher
Short description	A User or an institutional actor can take all images, organized and unorganized, put them in an archive online where they can continue to be accessed and reused. As metadata multiple data format shall be available which the user can provide: a spreadsheet, an xml file, anything already in a structured form. The user needs to preview before finalizing the upload
Preconditions	There is a table with metadata and a collection of photos named in this table. A precondition is the existence of guidelines (see section 6 below) and publicity / acceptance of guidelines
Basic flow	A user has a large collection of files with metadata or an entire archive. The images cannot be hosted anymore there and risk being lost. The

	user can use a batch upload tool to move the entire archive to another location and mirror it thus.
Alternate flow	
Priority	High
Status	Tools already exist to upload to open archives, as GLAM Wiki toolkit or Commonist for batch upload to Wikimedia Commons.

ID	3.9
Goal	Mirror collections
Main actor(s)	publisher
Short description	I want the data to be in many places, and stay connected
Preconditions	See previous
Basic flow	Even if the archive is staying, a user, owner of an archive might wish to mirror it to other archives to increase visibility and perusal of its data.
Alternate flow	
Priority	Medium
Status	Needed

ID	3.10
Goal	Deal with duplicates
Main actor(s)	Archives and people setting them up
Short description	Archives need to take responsibility on the contents of the archive but enforce mechanism to share this with users. A user which is notified of relevant related contents newly upload could easily detect duplicates, check data, etc.
Preconditions	Archives accept submissions and annotations exist for the images, as well as notifications and image similarity recognition services
Basic flow	A new image is uploaded as part of an archive. The similarity search spots an exact match with an existing image. The image is uploaded and a user notified that content relevant to his field of interest has been uploaded. The image is marked as possible duplicate. The user checks the duplicates and discards it or accepts it justifying the choice. The user who uploaded the new images is notified of the decision.
Alternate flow	
Priority	High

Status	Needed
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ID	3.11
Goal	Deal with partially uploaded collections
Main actor(s)	Archives
Short description	The upload of a collection has been interrupted. Archives should know way and act accordingly.
Preconditions	There is an upload tool and archives accepting uploads.
Basic flow	A user starts to upload a collection but the computer crashes leaving the job half way. The archive is notified and keeps track of this making sure that either the upload is completed or that the archive is marked as incomplete.
Alternate flow	
Priority	Medium (because of missing preconditions)
Status	Needed

ID	3.12
Goal	Find images and work with them
Main actor(s)	Archives
Short description	The user needs to easily find images searching a browsing the collections, possibly from each entry point he needs to see all connected collections
Preconditions	The images are somewhere
Basic flow	The user searches for an image and finds it. He wants to alter it for its own purposes. He can download it or use a basic tool to alter it online.
Alternate flow	The user browse all linked collections of images from each archive providing the distributed service, finds the image and can play with it with a tool wherever the image is stored.
Priority	Medium
Status	Needed

ID	3.13
Goal	Know if I can reuse an image and where I can get permissions
Main actor(s)	Author, Archives

Short description	Once the user has found the images needed he can collect them in his own local or remote space and organize them into a collection. To each image is attached information which allows to know which images can be reused and which cannot and for which distinct purposes.
Preconditions	Archives present data in consistent ways, e.g. IIIF
Basic flow	The user builds a collection and does his work. At the moment of publication images marked as non available for reproduction do not appear and are either substituted automatically by others or by a placeholder. As they become available they appear regularly. Annotations remain attached to the photo and become visible as the image acquires rights for distribution.
Alternate flow	
Priority	High
Status	Available for IIIF archives

ID	3.14
Goal	Browse data, find out what is available already, what would be needed
Main actor(s)	Archive
Short description	Get to know easily what is available as it becomes available. If there is already a good OCR of a book I might not want to do it. I also want to know if there is one which I can improve, make it better and share it
Preconditions	Storage, annotations, identifiers
Basic flow	The user access the archive and browse by ancient author. He sees which works have been scanned and ocr'd and which instead have only a resource somewhere of a given quality. The user can then decide to add information about resources he knows about which are not listed or produce an ocr and upload it to the archive.
Alternate flow	
Priority	High
Status	Needed

4. Preserve images, annotations

ID	4.1
Goal	Long term preservation
Main actor(s)	Archive

Short description	Store images for a long time in a stable and permanent location, I want it not to matter if it changes location in time
Preconditions	Institutional backing, policies
Basic flow	
Alternate flow	
Priority	High
Status	Available under conditions

ID	4.2
Goal	Query repo for images
Main actor(s)	Tool developer
Short description	Query external repositories for images of a text (inscription, manuscript, etc) and make those images (either as a whole, or regions of interest on the images) available alongside the text as the target of annotations on the text
Preconditions	Access to images, exposition of images online
Basic flow	The archive is IIIF compliant, a user can access the images and use them as desired
Alternate flow	
Priority	High
Status	Possible

ID	4.3
Goal	Query repo for annotations
Main actor(s)	Tool developer
Short description	Query repositories of image annotations and find all that have been annotated with a specific semantic tag, and retrieve the annotation and link it to its source image
Preconditions	Annotations
Basic flow	The user queries the annotations and finds out all photos of inscriptions from a given place which have an annotation associated with it in the annotation repo.
Alternate flow	
Priority	High
Status	Needed

ID	4.4
Goal	Manage access to images
Main actor(s)	Editor, Author
Short description	Once images from distributed repositories are collected in a local collection, the user needs to be able to manage access to images in collections
Preconditions	Availability is known from archival data. Collections are possible, images are in distributed repositories
Basic flow	The user has found two manuscripts. One is accessible, one is not. The user can use it according to the policy but he cannot publish it. The user puts that part of the data under password.
Alternate flow	
Priority	Low
Status	Possible for certain archives

ID	4.5
Goal	obtain data on the history of a connections between images and texts
Main actor(s)	publisher
Short description	Get information on stages of images publication and quality of the image
Preconditions	As above
Basic flow	As above
Alternate flow	
Priority	Low
Status	Possible

ID	4.6
Goal	Set up a collection of images
Main actor(s)	Editor, Author
Short description	Create a virtual collection of images from a variety of sources and reuse them in a digital publication
Preconditions	Images are accessible and presented online.
Basic flow	The user searches the archives and finds several images here and there. He collects them in a local or remote service repository, adds his own

	images to that which get uploaded accordingly. He can then locally organize and edit them without affecting the place where they are stored.
Alternate flow	
Priority	High
Status	Needed

5. View, display images

ID	5.1
Goal	View selected images and their annotations
Main actor(s)	Editor, Author, Software developer
Short description	Display selected images
Preconditions	The images is available, the user has access to a viewer
Basic flow	The user has a photo online, has annotated it and wants to display it.
Alternate flow	
Priority	High
Status	There are already many viewers available

ID	5.2
Goal	Visualize the content connected to the annotation
Main actor(s)	reader
Short description	I can use the annotation to display the image or the portion of image and the transcription
Preconditions	There is an available image and an annotation
Basic flow	The user knows of a place and want to display a list of photos of documents which have been associated with that place. He queries the annotations to get such list and visualize it.
Alternate flow	
Priority	High
Status	Needed

ID	5.3
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Goal	Notification of new related content
Main actor(s)	Archive
Short description	When related content is uploaded users uploading similar things are notified.
Preconditions	There are photos, the user has uploaded photos to the archive
Basic flow	A user typically uploads images categorized as “Documents from Sparta”. Another user uploads an image and adds an annotation to categorize it in Documents from Sparta. The first user gets an alert about this new content. Queries for Documents from Sparta will automatically return also the new image.
Alternate flow	
Priority	High
Status	Needed

ID	5.4
Goal	Image comparison and recording of matching and elaboration as annotations
Main actor(s)	Reader, user
Short description	A user compares two images, merges them, saves one new complete image
Preconditions	The images are available and presented in a feasible way. It is possible to save annotations somewhere and retrieve them.
Basic flow	A user finds two photos of distinct fragments of an inscriptions. He figures out that they might join, he modifies scale, rotation, colour etc and matches them nicely. He saves the result as a new photo with its annotation and annotate the two original files as merged into another
Alternate flow	
Priority	High
Status	Possible with IIF

ID	5.5
Goal	Scale for images
Main actor(s)	reader
Short description	Have a sense of the scale of the object I am seeing in reality with a ruler like or a comparison feature
Preconditions	There is an image and there is a viewer

Basic flow	The user visualizes an image with a comparative ruler beside to have the scale of the object rather than the scale of the photo
Alternate flow	
Priority	Low
Status	Desirable

ID	5.6
Goal	Alter images to highlight different aspects
Main actor(s)	Reader, user
Short description	Alter lighting, colour, to see the images. check EAGLE epigraphy papers
Preconditions	There is an image in a viewer
Basic flow	The reader wants to change settings and see different effect applied to images for heuristic purposes. Often Ancient documents reveal details on photos which are not visible to the human eye.
Alternate flow	
Priority	Medium
Status	Desirable

6. Collaboration, guidance

ID	6.1
Goal	Guide people in what best practices there are and they could use
Main actor(s)	Experts group
Short description	Cookbook on how create a linked-open-data publication of one or more Photos of ancient documents
Preconditions	
Basic flow	A simple guide is prepared to give basic advise in simple steps to work with images of ancient documents. The guide tells what options are available to share, find, visualize, use images of ancient documents, with recommendations on where to upload images, examples of previous projects and best practices, links to editors to produce annotations and connect resources
Alternate flow	
Priority	High
Status	Needed

ID	6.2
Goal	Give guidance on how to post images of a document online in the most responsible way
Main actor(s)	Experts, Perspective author, Libraries and local institutions
Short description	Options are given on how to store image, collect them, manage them, use and visualize them.
Preconditions	
Basic flow	Provide clear and very simple guidelines for the task of sharing images only. (This would be a nutshell version of 6.1)
Alternate flow	
Priority	High
Status	Needed

ID	6.3
Goal	Give guidance on how to contribute to existing projects
Main actor(s)	Perspective author
Short description	Link to cookbooks, to tools and procedures to contribute to open projects
Preconditions	It is possible to contribute to a project
Basic flow	Projects accepting contribution provide clear guidance on how to do on their website and on commonly used sources of information
Alternate flow	A website lists the possibilities and ways to contribute to project.
Priority	Medium
Status	In progress

ID	6.4
Goal	Guide people in what best practices there are and they could use
Main actor(s)	Expert group
Short description	A question and answer website as Stackoverflow could provide common questions with specific answers to the benefit of all practitioners.
Preconditions	Experts willing to answer, known and used platform.
Basic flow	An interested user asks a specific question, of whatever complexity and all can see it and answer to the best of their knowledge. Answers get

	votes and questions are edited to give the more precise information possible.
Alternate flow	A user sends an email to somebody he knows, or sends an email to a mailing list, both method which should still remain but cause a lot of redundancy.
Priority	High
Status	There are attempts but in hidden places on the web

Recommendations for priorities on management of images of ancient documents

1. A stable, third party place to archive images and annotations, set up query services, to upload and retrieve images, to edit annotations and make them available is the most urgent need in the domain of ancient documents and especially for ancient Inscriptions, which are kept in archives often closed and with an extremely limited access (only viewing of low resolution file without any kind of reuse). This would absolve individual projects from replicating common problems and would also give an option to efforts which have reached the end of their efforts and might go lost.
2. An overview of what is available online accessible from multiple points would be another major desideratum. This could be a list of annotations which can be visualized completely or in parts by all parties involved and could be collaboratively updated to give distributed visibility to contents already online, contents needing documentation (images, scans, etc.) and those instead which have already received attention. This would avoid many duplications of efforts and highly contribute to direct intents, evaluate new proposal, start up new projects.
3. All tools which can simplify as much as possible annotation tasks, upload tasks, editorial tasks and make them user friendly, which take into account current efforts take us a step closer to a complete conversion in attitudes towards digital scholarship.
4. Reviews and nice documentation of code and software together with humanly understandable explanations of them would also be very welcome and contribute to buy in. Tools and documentation should be present as needed without forcing learning if there is no curiosity about the mechanism but only eagerness to get results.
5. Prepare cookbooks and guidelines at the same time as the tools are prepared, updating existing ones while going along. Many different guidelines if needed, and perhaps also a question and answer forum.
6. Naming conventions should be followed and should go a long time. Attentions should be paid at non reiterating endeavours to name entities where no alignment is proposed.
7. Provide individual and group training and summer school. Promote collaborative teaching of digital humanities which integrates efforts taken to promote semantic encoding, digitization, linked data, and best practices, making students a priority rather than scholars