



Assessment Information

[CoreTrustSeal Requirements 2017–2019](#)

Repository: Phaidra at the Library System of the University of Padova
Website: <https://phaidra.cab.unipd.it/>
Certification Date: 13 November 2019

This repository is owned by: **Università di Padova**



Phaidra at the Library System of the University of Padova

Notes Before Completing the Application

We have read and understood the notes concerning our application submission.

True

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

CORE TRUSTWORTHY DATA REPOSITORIES REQUIREMENTS

Background & General Guidance

Glossary of Terms

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type. Select all relevant types from:

Institutional repository, Library/Museum/Archives

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Brief Description of Repository

Phaidra at the Library System of the University of Padova is the repository for which CTS certification is required.

Phaidra [1] is a comprehensive university digital asset management system with long-term archiving functions owned by the Padova University Library System [2] (henceforth: Library System).

Phaidra, an acronym that stands for Permanent Hosting, Archiving and Indexing of Digital Resources and Assets, was developed on the basis of the open source software Fedora by the University of Vienna [3], with which the University of Padova has collaborated since 2010.

The operation and further development of the Fedora-based repository is carried out at the University of Vienna. The University of Padova is the oldest Phaidra partner, with a very competent team of developers.

Phaidra offers the following features:

- Long-term archiving of digital objects (pictures, documents, books, video, audio and collections)
- Permanent links and handle persistent identifiers assigned to digital objects
- Use of international classifications
- Use of standard metadata schemas (DC, LOM)
- Clarification of legal issues (terms of use and licensing models)
- Multilingual user interface
- Different kinds of support (helpdesk, tutorials, workshops)
- High definition image viewer [4]
- Book viewer [5]
- Collection viewer [6], the tool to embed digital collections stored in Phaidra in external websites
- Phaidra Importer [7], the application that uploads books, collections and videos to Phaidra
- Phaidra is in compliance with FAIR principles (Findable, Accessible, Interoperable, Reusable), as indicated by Guidelines on FAIR Data Management in Horizon 2020

The platform is multidisciplinary and hosts 403,000 digital objects (as of 31 October 2019), such as images, text documents, books and videos, mostly deriving from the digitization of analogue originals. The different types of cultural heritage represented include rare books, manuscripts, photographs, educational wallcharts, maps, museum objects,

archival material and parchments.

Phaidra's current digital collections are from Libraries, Museums and Archives of the universities of Padova and Venice and other cooperating institutions.

The Phaidra staff [8] is composed of librarians and IT staff of the Digital Library Unit of the Library System and guarantees the maintenance and development of Phaidra.

The Phaidra staff is responsible for the coordination of the Library System digitization projects, providing assistance and support to the designated community concerning the storage of digital objects in Phaidra. Phaidra interacts with the community in the following way: the staff of Phaidra receives the profiles of the digitization projects, analyses the requests and fixes an interview with the interested parties to define the organizational aspects of the project. During the course of the project, the staff provides support at a distance and/or with further meetings.

There are many Phaidra installations of different institutions in Europe. The repository is integrated differently in each institution. Some partners run their own installations and can also carry out hosting for other partners. Others do not have their own installation, but are hosted by other institutions.

The widespread Phaidra community [9] comprises the following countries: Austria, Bosnia and Herzegovina, Italy, Montenegro and Serbia.

1 <https://phaidra.cab.unipd.it/>

2 Library System at a glance: http://bibliotecadigitale.cab.unipd.it/en/international-area/library_%20system_at_a_glance

3 <https://phaidra.univie.ac.at/>

4 An example of image viewer visualization: <https://phaidra.cab.unipd.it/imageserver/o:330988>

5 An example of book viewer visualization:

<https://fc.cab.unipd.it/fedora/get/o:930/bdef:Book/view?language=en#page/1/mode/2up>

6 An example of collection viewer visualization:

<http://mostre.cab.unipd.it/paleo/en/14/le-tavole-parietali-di-karl-alfred-von-zittel>

7 See Digital Book https://phaidra.cab.unipd.it/help_long#multiplo

8 <https://phaidra.cab.unipd.it/info/impressum#structure>

9 Phaidra International: <https://phaidra.org>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Brief Description of the Repository's Designated Community.

The University of Padova, in the course of its 800-year history, has enriched its heritage with a number of historical buildings, scientific instruments, collections pertaining to the natural sciences and medicine, iconographic materials, archaeological finds, paintings, manuscripts and rare books.

Today, all these materials, which often describe the origin of the natural sciences and medicine, may be found in rich archives, museum collections and libraries, and are extensively used for research and teaching purposes as well as for the general enjoyment of the public.

All these collections are now included in a digitisation project with the aim of making them available online in an environment that allows ease of searching, browsing, retrieval, and reuse. With this work, we intend to make a significant and ongoing contribution to the global digital library. Moreover, the Library System has established the Phaidra platform to promote its own rare, prestigious cultural and documentary heritage and to meet the user's needs for quick and easy access to digital information.

Phaidra is a multidisciplinary platform that hosts digitization projects promoted and implemented by the designated community that consists of faculty, staff and students of the University of Padova interested in Digitised Cultural Heritage for research and educational purposes. In addition, in parallel with the two traditional missions of scientific research and academic teaching, Italian universities today must also pursue - as a strategic objective - the third cultural and social mission of the university, which includes the promotion of cultural heritage.

We collaborate with libraries, museums, archives, centres and departments of the University. Furthermore, with the same purposes and in compliance with the terms of use of the service, the University of Padova has established partnerships with other institutions for hosting their digital collections in Phaidra. They are institutions of the Veneto Region: Ca' Foscari University and the Università Iuav in Venice; the Biblioteca Nazionale Marciana (National Library of St Mark's) in Venice, the Episcopal Seminary Library in Padova and the Biblioteca Universitaria di Padova.

The Designated Community can use our trusty and friendly platform to archive their historical cultural scientific research, to use the digital collections as teaching tools, to promote the knowledge in the context of Citizen Science.

The heterogeneity of the contents ranges from both the humanistic and scientific areas. To contextualize different types of usage, we highlight examples of digital collections:

- Electronic Library of Linguistics and Philology [10] fosters the historic-linguistic knowledge of the Italian language
- Titus Livius (Padova, 59 BC - 17 AD) digitized manuscripts [11] will be constantly expanded and enriched with the most recent results of the research
- The cultural heritage of the Padovan Medical School [12] highlights the contribution of the Paduan Medical School to the development of modern medicine

- Fabio Metelli Archive [13] is formed of the scientific and working papers of Fabio Metelli (1907–1987), a director of the Psychology Institute of the University of Padova and a key figure in the history of Italian experimental psychology
- The historical Archive of Padua's Botanical Garden [14]. This project will enhance the history of Padua's Botanical Garden and will allow scholars from different areas, from botanists to historians, to systematically use this heritage for their research.

- 11 https://phaidra.cab.unipd.it/collections/totus_livius
12 https://phaidra.cab.unipd.it/collections/scuola_medica_padovana
13 <https://phaidra.cab.unipd.it/collections/metelli>
14 <https://phaidra.cab.unipd.it/o:415661> (the project is on-going) [in Italian]

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Level of Curation Performed. Select all relevant types from:

C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Comments

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Outsource Partners. If applicable, please list them.

We do not outsource any service. The repository is located, configured and managed in-house by the Library System.
We have an organizational relationship with our University Computer Centre [15] for the data replication service.

15 <https://www.ict.unipd.it/>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Other Relevant Information.

The figures in 2018 are:

Digital objects of Phaidra: 395.969

Items of Phaidra: 25.275

Website visits: 30.039

Web page visualisations: 234.192

Matomo (formerly Piwik) is the web analytics application connected to Phaidra.

Phaidra is registered in re3data.org [16] and OpenDOAR [17].

18 <https://www.re3data.org/repository/r3d100012962>

19 <http://v2.sherpa.ac.uk/id/repository/4368>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

ORGANIZATIONAL INFRASTRUCTURE

I. Mission/Scope

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The scope of Phaidra is to collect, preserve, and provide access to the digital objects generated by the various libraries, departments, centres and museums of the University of Padova and other cooperating institutions, as well as to ensure that these digital objects will be available to future generations. The archival activities we implement enrich education and research, improve access to Cultural Heritage and serve as a source of information for our community and citizens. We aim to: provide reliable archiving, support the archiving procedure, facilitate the access of scholars to Cultural Heritage for research and educational purposes, and to promote and disseminate said Cultural Heritage. Since Phaidra is an open access website, any visitor can search and browse digital collections and, unless otherwise indicated, display and reuse digital objects.

One of the goals of the mission of the Library System is “to guarantee the widest possible e-access to scientific information through the University Digital Library” [18]

The regulation of the University Library System [19] was approved by the Padova University Board of Administration [20] on 4/06/2018.

The articles of the regulation concerning the Digital Library are related to Phaidra, which is one of the services of the Digital Library. In particular, we point out these articles:

Art.1 – Purpose

1. Under Article 56 of the University Statute and articles 122, 123 and 124 of the University General Regulations, the University Library System (hereafter: System) is the set of library resources and services of the University of Padova.

2. The System aims to:

- a. organise the conservation, updating and use of the bibliographic and documentary assets of the University Libraries;
- b. guarantee the widest access to scientific information through the development of the Digital Library of the University and the use of electronic resources;
- c. manage these resources and services in order to provide priority support to research and teaching activities of the

University units.

Art. 2 - Library System Units

...

7. The Digital Library of the System is the organized set of services and features that permits access to a plurality of resources and information sources hosted on local or remote platforms. The rights of access and use are negotiated by the System with the rightsholders.

Art. 10 – Resource allocation

1. The University attributes to the System the financial and personnel resources necessary for its functioning and for the pursuit of its objectives.

...

18 <http://bibliotecadigitale.cab.unipd.it/en/the-library-system>

19 http://bibliotecadigitale.cab.unipd.it/chi_siamo/documenti-sba/SBA_Regolamento20180621_Tabella120180716.pdf [in Italian]

20 The Board of Administration has strategic, management and control functions of the administrative, financial and economic activities of the University as well as the supervision of the financial sustainability of the activities

<https://www.unipd.it/en/university/governance/board-administration>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

II. Licenses

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The legal relationship to content providers is governed by the Terms of Use [21].

To upload digital objects in Phaidra, login is required.

The University of Padova informs its users that the digital objects stored in Phaidra may be open access (all users including visitors can view previews, metadata and files) or restricted access (all users can view previews and metadata, but files can only be viewed by authorized users). The choice of the type of access has to be made at uploading.

The legal relationship to the final users is controlled by the use of licenses.

Licenses are assigned to digital objects choosing between: Creative Commons Italia 2.0, Creative Commons International 4.0, GNU GPL. Additionally, there is the copyright note “All rights reserved”.

In case of non-compliance with conditions of access and use, the terms of use at the section WHAT HAPPENS IF THE USER DEPOSITS NON-COMPLIANT DIGITAL OBJECTS? state that: “In the event that the University of Padova has knowledge or notice of any circumstances from which the illegality of activity or illegal nature of digital objects is noted, it is entitled to promptly suspend, block access and/or notify the competent authorities.

Similarly, the University is permitted to delete and remove digital objects and data that could harm the database and computer applications.

In any case, in any civil and/or criminal actions by third parties who consider that their rights have been violated as a result of user behaviour, the University of Padova will have the right of compensation and will call into question the latter.”

There is information pursuant to art. 13 and 14 of Regulation (EU) 2016/679 on the protection of personal data [22].

21 https://phaidra.cab.unipd.it/terms_of_use/show_terms_of_use

22 <https://phaidra.cab.unipd.it/info/privacy>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

III. Continuity of access

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Phaidra is owned and maintained by the Library System.

Continuity of access is defined by the Phaidra Terms of Use, the Statute of the University of Padova and the Regulations of the University Library System.

The Terms of Use of Phaidra, updated to June 2019, state that "Technologies for the preservation of digital objects evolve and develop over time. The University, through its Digital Library, organizes and makes available its electronic and digital resources through services of the most advanced standards. Even if the Phaidra platform were to close in favour of new forms of service, the University is committed to preserving, to the best of its abilities, the uploaded digital objects deposited in Phaidra and to making them accessible and usable over time. It also undertakes to provide, on request, a digital copy to the individual user who originally uploaded such objects."

In the Statute of the University in Art. 56. it is stated that:

"... 3. The University embraces the principles of full and open access to scientific literature and promotes the free online dissemination of the results of research produced in the University, to ensure the widest possible dissemination.

4. The University aims to implement the principles of full and open access to data and products of scientific research, encouraging their deposit in the institutional archive and communication to the public, in compliance with the laws concerning intellectual property, confidentiality and protection of personal data, as well as the protection, access and enhancement of cultural heritage."

To implement these principles, the Library System provides the academic community with suitable repositories for the

management and preservation of doctoral thesis, digital objects and research data, respectively Padua@research, Phaidra and Research Data Unipd.

The Regulations of the University of Padova Library System - Sistema Bibliotecario di Ateneo (SBA) - (Chapter V, Articles 10, 11, 12) provide evidence of the financial resources made available by the University for the development and maintenance of the technological and service infrastructure of the Digital Library, of which the institutional repositories, Phaidra, Research Data Unipd, Padua@research, are an integral part.

Thanks to these economic resources, the Library System can guarantee a medium-term financing plan, until at least 2023, for the maintenance and development of the complex of physical structures, human and financial resources and services intended to support the digital repositories created for the conservation and enhancement of cultural heritage, for the management and archiving of research products and data.

With regard to long-term digital preservation, the Padua@research, Phaidra and Research Data Unipd repositories guarantee long-term preservation and access to their data and metadata.

Technologies for the preservation of digital objects evolve and develop over time. The Library System, through its digital library, organizes and makes its electronic and digital resources available through services of the most advanced standards and is committed to preserving the data and metadata stored in its repositories to the best of its ability and to making them accessible and usable over time.

For continuity of access, see R10 and information on the website of the Library System: "Maintenance and development of the technological infrastructure of the Digital Library" [23] and "Digital preservation" [24].

23 <http://bibliotecadigitale.cab.unipd.it/bd/archivi-istituzionali-1/archivi-istituzionali-ad-accesso-aperto-per-pubblicazioni-e-dati-di-ricerca> [in Italian]

24 <http://bibliotecadigitale.cab.unipd.it/en/digital-preservation>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

IV. Confidentiality/Ethics

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

A set of Phaidra guidelines and tutorials provides comprehensive guidance for its users about data management from the pre-ingesting to dissemination of data (for example, requirements for archiving, depositing procedure, agreements, data files and formats).

Phaidra staff works with data providers before the data deposit to ensure that all relevant information is included and invite them to inspect relevant laws, regulations and ethical codes. The Phaidra staff check that the copyright has been cleared and there are no legal and ethical restraints to archiving. Data producers who wish to deposit in Phaidra have to accept the Terms of use.

According to the Phaidra Terms of use, for a proper use of the platform and user protection, the depositor must pay close attention to: reading and learning about the conditions of use and the terms of law for optimal and legal use of the platform; be aware that he/she is solely responsible for his/her actions; do not insert any object or information of discriminatory, extremist or pornographic character, that offends public morals and decency, which is contrary to legal norms and in terms of safety [25] and to be aware of the code of ethics [26] relating to their own context of reference (library, archive, museum, research).

25 For example, the digital object <http://phaidra.cab.unipd.it/o:416593> contains photographs of children. In this case, the rights owner confirmed that all the children's parents signed the waiver.

26 <https://phaidra.cab.unipd.it/info/ethics>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

V. Organizational infrastructure

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Phaidra is a service of the Digital Library that is an organizational unit of the Library System.

The mission of the Library System is to preserve, update and promote the use of the University bibliographic and documentary collections; to guarantee the widest possible e-access to scientific information through the University Digital Library; to support University research and teaching activities and to support the Users of the Library System [27].

The Library System guarantees the continuity of preserving and providing access to the Phaidra repository by creating appropriate organizational and financial conditions for its functioning (refer to R3).

The Phaidra staff [28] is composed of librarians and IT staff of the Digital Library Unit [29] and works on the maintenance and development of Phaidra. Moreover, it supports the Central Libraries and the Library Clusters in the drafting of digitisation projects and provides assistance and advice in the creation and archiving of digital collections to the University of Padova Units and to other cooperating institutions outside the University [30].

The Digital Library Unit has sufficient staff to fulfil its mission and tasks. With regard to Phaidra, the employees' roles are: 1 project manager, 2 librarians committed to the digitisation workflow, metadata issues, contact and support of the designated community, 1 metadata librarian, 2 IT staff for infrastructure management, software development and web design. The connection between the Phaidra staff and the libraries of the System is maintained by 10 librarians dealing with digitisation projects.

The main tasks of Phaidra professionals are dependent on their work duties and regard the following fields: digitisation, digital preservation, (meta)data models and schemas, web design, basic (or advanced) IT, statistical qualifications, legal issues and rights clearance.

The Phaidra staff participate in the training courses reserved for employees of the University of Padova [31].

Recap of the web page on training courses: The Resources Training and Development Service takes care of the training and updating of employees, through their participation in the training activities made available by the University, in accordance with the Training Plan prepared by the Organization Development Office - Training Sector.

This participation must take into account the professional profile held by the employee, so that training is a tool aimed at developing the knowledge and skills actually foreseen by the specific organizational position.

The managers of the units may provide for the participation of the staff also in training activities to be carried out outside the University, with the aim of encouraging those training initiatives with specialized content, not included in the University Training Plan.

The managers of the units can also provide for the organization of specific training activities, to respond to the particular training and development needs of the staff of their structure or even of several interested structures.

Finally, the University can encourage the participation of the staff of external bodies and structures, which request them, in the training activities organized by the University.

The Library System is also active in fostering the training, professional development, participation in meetings and conferences of dedicated staff, thus ensuring the appropriate professionalism, knowledge and experience of staff in the management of digital repositories.

The Phaidra staff have been participating in the Erasmus+ staff Mobility for Training [32] since 2009. The training periods take place at the University of Vienna. The University of Vienna employees also come to the University of Padova for their Erasmus staff Mobility in the Phaidra context.

27 <http://bibliotecadigitale.cab.unipd.it/en/university-library-system-users>

28 <https://phaidra.cab.unipd.it/info/contact>

29 http://bibliotecadigitale.cab.unipd.it/chi_siamo/organizzazione-sba/ufficio-biblioteca-digitale

30 Organisational structure: <https://phaidra.cab.unipd.it/info/impressum#structure>

31 <https://www.unipd.it/corsi-formazione-riservati-dipendenti> [in Italian]

32 <https://www.unipd.it/erasmus-staff> [in Italian]

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

VI. Expert guidance

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either inhouse or external, including scientific guidance, if relevant).

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

As described in R5, the management of Phaidra requires different professional skills and competences.

With reference to the designated community, the Library System promotes digitisation projects with the aim to digitise and to archive in Phaidra important collections that relate to a wide range of disciplines. For this purpose, a Digitisation project information sheet is available (refer to page 23 of the Guidelines on Digitisation [33]), in which specific roles are defined and described in detail:

- The scientific manager is the discipline expert who takes on responsibility for the selection of the materials and defines and assures the quality of the metadata. In the selection phase, he/she is supported by the project manager, particularly for the examination of the materials and for legal aspects.

The proponents of a digitisation project identify a scientific coordinator for the disciplinary area of that project.

- The project manager cooperates and supports the scientific manager in the analysis of the legal issues, coordinates the activities related to the digitisation and guarantees the quality of the metadata.
- The technical coordinator, as coordinator for technical-operational activities, collaborates with the Phaidra staff, which in turn provides technical assistance.

An external legal advisor is consulted on any legal issues.

The staff of Phaidra and the designated community interact with each other, as specified in the “Brief description of the Repository Designated Community”.

The main channels of communication with the designated community are:

- Phaidra mailing lists: phaidra-annunci@cab.unipd.it
- News on the Library System website <http://bibliotecadigitale.cab.unipd.it/>
- Workshops on Phaidra and related services (the last one was a workshop on the Third Mission of the University [34])
- The SBA Annual technical report [35]

33 <https://phaidra.cab.unipd.it/static/linee-guida-digitalizzazione-EN.pdf>

34 http://bibliotecadigitale.cab.unipd.it/chi_siamo/i-progetti/new-roles-for-the-university-libraries-third-mission-and-citizen-science/new-roles-for-the-university-libraries-third-mission-and-citizen-science.-presentation_EN

35 http://bibliotecadigitale.cab.unipd.it/en/international-area/library_%20system_at_a_glance [in Italian]

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

DIGITAL OBJECT MANAGEMENT

VII. Data integrity and authenticity

R7. The repository guarantees the integrity and authenticity of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The Phaidra staff manage the entire chain of custody for datasets. The repository technology system ensures the integrity and authenticity of data during all stages of the curation workflow. Phaidra uses Fedora as a repository platform, which is based on the OAIS model, for tracking the integrity and authenticity of all digital objects housed in the system. In particular, depositor identity is verified through registration in the Phaidra system, and an account is then provided. The dataset is thus linked to the data producer's account, and only the data producer may change his/her own digital object metadata. The digital object datastream cannot be changed by the data producer once the object is archived in Phaidra. The data producer can create a new version of the object which has the same authenticity level of confidence. For details, see the Guide to archiving [refer to R8 for the content of the guide].

- Phaidra uses internal Fedora automatic MD5 checksum feature that periodically verifies that objects have not changed (data fixity – API: <https://fedora.info/2018/11/22/spec/#binary-fixity> Checksum <https://wiki.duraspace.org/display/FEDORA38/Checksums>)
- Phaidra digital objects submission requests are reviewed by the Phaidra staff that manages to fix all the shortcomings with the data contributors (metadata completeness and quality, file types, etc.). See R12 Workflows
- All the original files and their changes are tracked, including metadata and rights changes (Audit fedora and versioning <https://wiki.duraspace.org/display/FEDORA38/Versioning>)
- Versions on metadata changes are recorded on the foxml datastream
- Handle is the persistent identifier assigned to the digital objects archived in Phaidra
- To archive digital objects in Phaidra an email address or institutional account at the University of Padova is required to obtain credentials. To open an account, it is necessary to send a request to the IT staff via the Library System Help desk [36]

36 <http://bibliotecadigitale.cab.unipd.it/en/helpline>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

VIII. Appraisal

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The Phaidra platform promotes the Cultural Heritage valorisation of the University of Padova and the other collaborating institutions with the aim of making the digital collections available online in an environment that allows ease of searching, browsing, retrieval, and reuse. In this regard, the “Editorial policies for anyone creating content on the website” [37] provides information on the Phaidra Identity.

The quality and the development of the digital collections are guaranteed by the pre-ingest and ingest procedures of the repository. The Guidelines on Digitisation outline the pre-ingest workflow: objectives, selecting documents, legal aspects, preservation, digitisation and archiving in Phaidra.

We point out that the selection criteria generally measure:

- historical and cultural value
- uniqueness and rarity
- high demand
- material without legal constraints or digitisation permits obtained
- restricted access due to the condition, value and location
- value added through online access, the creation of virtual collections, increased interest in little known or unknown material

The files uploaded to Phaidra are required to have a minimum level of quality and detail (refer to section 5 of the Guidelines on Digitisation).

Ingesting in Phaidra consists of uploading digitised files and entering the necessary metadata for the identification and description of the digital item.

It is possible that the object being archived is catalogued in other systems, such as an online catalogue or other platforms,

so it is recommended to contact the Phaidra staff to determine the procedure for the possible migration of data.

In the ingest phase, the depositor uploads data files in Phaidra according to preferred formats for archiving [38]. Certain file formats (Microsoft Word, Microsoft PowerPoint, etc.) are not recommended as suitable for preservation and – consequently – for the long-term archive. The depositor is advised to convert them into the recommended formats. If this is not possible, the type of object labelled Other enables the depositor to archive these digital objects.

After the uploading, Phaidra Metadata Editor [39] allows the depositor to fill in the metadata. A set of metadata is mandatory: identifier, title, language, description, author, status and rights & licences. Then there are recommended and optional metadata. Uwmetadata is mapped to Dublin Core and Museum metadata (Italian Museum Standards of the ICCD - Central Institute for Cataloguing and Documentation of the Ministry of Cultural Heritage).

The Phaidra Guide to archiving explains the procedure for creating and managing a digital object in Phaidra. The summary is:

Chapter 1 gives preliminary information on the platform and on digital objects.

Chapters 2, 3, 4 illustrate the way of archiving single and multiple digital objects through the Phaidra metadata editor and the Phaidra Importer (the application that uploads books, collections and videos to Phaidra)

Chapter 5 is dedicated to the tools to visualize the digital objects and to present the collections

Chapters 6, 7 deal with the modification of digital objects and the creation of relationships between them

Chapter 8 contains an in-depth analysis about the “date” in Phaidra

Chapter 9 presents the crosswalk between Phaidra Uwmetadata and Dublin Core

The description of Phaidra Uwmetadata is as follows:

“The foundational data model of Phaidra, called Universität Wien metadata and abridged as UWmetadata, informs the design of Phaidra metadata, both in terms of representation of the values as well as the description of the contents. It is the result of the expansion of the IEEE Learning Object Metadata (LOM) standard (IEEE 1484.12.1 – 2002), and the combination of elements of different metadata namespaces. This places UWmetadata among the examples of application profile (AP), which for example include the data profile of the portal for CulturalItalia PICO, the data profile of the portal for Europeana E(uropeana)D(ata)M(odel) and the former E(uropeana)S(eman-tics)E(lements) as well as the application of EDM in the context of the Digital Public Library of America and the German Digital Library.

In general, the LOM schema is a data model, usually encoded in XML, used to describe learning objects or digital resources for educational purposes such as learning supports. LOM, as its UWmetadata application profile, structures the metadata in accordance with a hierarchy of elements defined in nine top-level categories, and containing groups of attributes in a tree structure.” [40]

The mapping from Uwmetadata to Dublin Core is online [41].

[37] https://phaidra.cab.unipd.it/help/editorial_policies

[38] <https://phaidra.cab.unipd.it/static/formati-file-compresso.pdf> (IT) - <https://phaidra.cab.unipd.it/static/EN-file-formats.pdf> (EN)

[39] https://phaidra.cab.unipd.it/help_long#3403

[40] Anna Bellotto, Cristiana Bettella. Metadata as Semantic Palimpsests: The Case of PHAIDRA@unipd, in: Communications in Computer and Information Science Digital Libraries: Supporting Open Science, 2019, 167-84. doi:10.1007/978-3-030-11226-4_14.

[41] https://phaidra.cab.unipd.it/static/phaidra_dc-metadata-element-set.pdf

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

IX. Documented storage procedures

R9. The repository applies documented processes and procedures in managing archival storage of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

Phaidra is based on Fedora [42], "a robust, modular, open source repository system for the management and dissemination of digital content", which includes OAIS-compliance capabilities. The two steps of the deposit are now described.

In the first step, the ingesting, a SIP (Submission Information Package) is received for the selection, evaluation and organization of the content. There are two default procedures, the Phaidra Importer tool and the bulk upload script, but the

content is usually sent through the simple and friendly Phaidra web interface.

The producers need authentication by issuing a local account, and they can then upload the digital objects.

The second step, the submission, is done automatically by the platform, through which the metadata is validated, the binary data (Octets) is stored and the checksums are created. Then an AIP (Archival Information Package) is generated for storing and archiving data. The platform automatically generated the DIP, as the dissemination of data is open, except in cases where the producers have closed the access to the binary content. However, the platform allows the dissemination of metadata.

The software and hardware system monitors any problems and is able to notify whether there are malfunctions, or if disks or parts need to be replaced. The hardware infrastructure is monitored via ILO (hp servers) and the software through the Vmware tools in order to minimize the risks. The Library System is provided with Veam software for back-up and the restoration of server images, and has an adequate number of servers in case of malfunctions, as well as secondary storage. The infrastructure is able to react quickly to malfunctions and setbacks. The Library System relies on ASIT (the University Data Centre) in case of catastrophic events to bring its services back online in a short time. Adequate physical storage capacity on servers is guaranteed to support Phaidra's activities.

The AIP consists of metadata and data in formats suitable for long storage. All the data of the System is regularly backed up. All the servers are located in a room that is monitored and whose physical access is limited to the authorized staff.

When the staff is not present, an alarm system and remote security monitoring is guaranteed. In regards to safety, the premises are regularly monitored by the University of Padova Security Unit.

Phaidra has an automated backup system. Each element (metadata and file) is saved together with the MD5 for integrity verification. Phaidra has the tools to perform regular analyses and intervene if necessary.

As regards storage, we possess advanced architectures (refer to R16) for multiple replication of data, automatic backup in multiple locations at the University of Padova. Moreover, every night a copy of the repository is planned, with the possibility of restoration in a few hours.

With regards to safety, the network is protected by a firewall and access to the machines is restricted to the operators. As mentioned above, the users with a verified account can upload digital objects in the platform. The Library System ensures an adequate hardware and software system to transfer, manage and publish data in a safe and traceable way. The data managers have documented and clear procedures in the internal wiki, so every storage operation can be performed by the team with the same results.

Regarding the electrical components, all equipment is fitted with safety devices compliant with legal standards. The system is divided by switches for each zone and type of use. In addition, there are two UPS to ensure continuity. Concerning safety, the premises are regularly monitored by the University of Padova's Security Unit.

Public evidence:

- a public page covers the general strategies on digital preservation [43]

- the internal wiki [44] describes the procedures. Below is a brief summary of the content:

“Procedures for managing storage in the Library System

Data management in the Library System is mainly done through the management of the virtual machines that contain them. The main operations are:

Creation of a VM

Through the Vmware environment, data managers can create a new VM. The network and storage parts require the most attention. For the network, the machine must be inserted into the relevant network, making sure that it uses an appropriate address. For the storage part, the default profile must be selected at the storage selection stage, except for virtual machines with special tasks.

Moving of a VM

VMs are usually assigned to servers in the available pool. Using VMware tools, it is possible to move a machine from one management server to another, with minimal downtime, in case of necessity (planned or unplanned maintenance, for example).

Restoring a VM

Through Veeam, it is possible to restore a VM from a dedicated backup storage. The recovery can replace the existing machine after or alongside a disaster recovery, for partial recovery of data or with the need to compare the evolution of the data over time.

Allocating an additional disk at a VM

An additional disk can be attached to the VMs. It is recommended for machines with a lot of data. Using the VMware tools, a new disk can be created (select the default policy unless otherwise indicated) on the machine. The disk, in the basic policy, will be backed up by the VM."

42 <https://duraspace.org/fedora/about/>

43 <http://bibliotecadigitale.cab.unipd.it/en/digital-preservation>

44 <https://wiki.cab.unipd.it/wiki-itcab/index.php/Servizi/Storage> (restricted access)

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:
Accept

X. Preservation plan

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

Digital preservation involves the combination of policies, strategies and actions to ensure the authenticity of content and long-term preservation, regardless of future technological changes. Digital preservation applies to both native digital and digitised content.

Strategic activities in support of digital preservation are aligned with the rules of the Library System, i.e. the preservation, updating and enjoyment of bibliographic and documentary heritage and access to scientific information through the development of the University Digital Library (Regulations of the University of Padova Library System, Heading I, Art. 1, Paragraphs 1 and 2).

Strategies and actions for digital preservation apply to the creation, integrity and maintenance of content.

The main actions pursued by the SBA for the long-term preservation of digital collections are as follows:

- Development and maintenance of digital archives for the long-term preservation of digital objects
- Management of different file and metadata formats
- Implementation of robust processes and automated mechanisms to ensure good management and preservation of content
- Continuous and reliable access to the content of digital objects for the designated community

Our long-term preservation strategy [45] is based mainly on the standardization of input data.

The document "Recommended file formats for long-term archiving and web dissemination in Phaidra" [46] gives an overview of the file formats to be used for long-term archiving and uploading to Phaidra. The document reads:

“There are no absolute criteria for choosing the file format. The choice is always dependent on different evaluations that the person who archives will have to make promptly, case by case, and will often result in a compromise between the best achievable quality and the limits imposed by the costs of production, processing and storage of files, as well as, for the previous, by the opportunity of a conversion to a new format.

This choice is particularly significant from the perspective of long-term archiving, for which a quality that respects the authenticity and integrity of the original document and a format that guarantees long-term access to data are desirable.

There are some general criteria that can be followed when choosing the most suitable format for archiving: Openness, Portability, Quality and Functionality, Development Support, Dissemination, Transparency, Self-documentation.”

For our designated community the priority is the preservation of the information content (images, books, videos, etc.). We have a single level of preservation, given the variety of content archived in the platform.

Important steps to guarantee the preservation of the platform are:

- control over the entire data supply chain. All the necessary actions are taken with the producer to integrate the missing information, paying close attention to the completeness of the data, both for long-term preservation (provenance, holding, rights, technical characteristics) and any formats suitable for long-term preservation. For example, even if we keep an original proprietary and undocumented file format, we convert the images in TIFF file format.

- control of data integrity. Every data modification is registered, using mostly the built-in mechanisms of Fedora. In particular, every metadata change is saved and is available to the repository. Checksums are applied on data and metadata, so we can monitor and intervene in case of accidental changes, software errors or incidents of another nature, through the recovery of data from the storage management.

- readability of the data. Phaidra's objective is that the data is always readable and interpretable by the designated community. We interact with the designated community (refer to Brief description of the designated community) on the use of data and we keep up-to-date about the evolution of text, image, audio and video formats.

Together with the producer, Phaidra considers legal, ethical and copyright issues, preserving this information so that the usability of the data will be known in the future. The usability is guaranteed by the preservation of the content and by wealth of information for the study and comprehension of the designated community.

There is a clear agreement between the producer and Phaidra through the Terms of use. By accepting the Terms of use, the producer agrees that the platform manages and disseminates the contents. Furthermore, the producer states that he/she owns the rights to deposit the object, the copyright and data confidentiality have been cleared, and he/she has taken into consideration the ethical issues, according to the ethical code of the University of Padova.

Phaidra provides a simple and secure ingesting of data (files and metadata), including the provenance and life cycle of the digital object.

Phaidra is committed to the long-term custody of the items deposited in the repository and strives to adopt the current best practice in the digital preservation.

As explained R3, all conditions for continuity assurance are met. The files and metadata formats respect the characteristics of long-term preservation (see R.8 and R.11) and satisfy our designated community.

The Phaidra migration plan has been adopted starting from 30th September 2019 and it is described below:

- submit our plan to stakeholders for approval
- analysis of the functionalities of the target platform for migration
- preliminary phase of analysis on file formats and on the level of preservation required for data and metadata. This phase is facilitated by the choices made on the formats and the format analysis document, as well as by the general nature of the metadata format.
- determining preservation actions based on format analysis
- metadata analysis, vocabulary normalization and other preliminary operations
- writing of the necessary actions including a possible transformation of the formats according to the required level of preservation, copying of the data and mapping of the metadata to new formats if necessary, in view of the required level of preservation.
- definition of the test criteria to evaluate the success of the migration
- definition and planning of any costs and verification of the availability of the planned resources
- Identification of responsibilities within the plan and definition of migration workflows

In the migration phase it will be necessary:

- prepare the cleaning of the data
- carry out migration tests. This phase is very important because it is useful to evaluate the planned actions and to verify them, making the necessary corrections
- possible modification of the plan and simultaneous updating of the documentation

A migration plan requires a high level of collaboration of all parties involved, from the stakeholders to all those who have to provide information (e.g., the level of preservation, verification of the success of the migration, and information on the destination platform).

To date, the responsibility for digital preservation follows that outlined in R.3 at the institutional level, and in R.16 for the technical part.

The Terms of Use specify the level of responsibility defined by Phaidra towards users and the needs related to long-term preservation (see: "The University undertakes to preserve to the best of its ability the digital objects stored in Phaidra and

to make them accessible and usable over time [47]”) and authorize Phaidra to manage data in a way appropriate to the purpose (see: "Authorized users can deposit digital objects in the platform making them available - according to the licenses issued - to third parties [48]”).

45 <http://bibliotecadigitale.cab.unipd.it/en/digital-preservation>

46 <https://phaidra.cab.unipd.it/static/EN-file-formats.pdf>

47 https://phaidra.cab.unipd.it/terms_of_use/show_terms_of_use#site-closes

48 https://phaidra.cab.unipd.it/terms_of_use/show_terms_of_use#who

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

XI. Data quality

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Phaidra uses metadata standards that ensure a good quality of metadata and enable the data interoperability.

Since Phaidra had to include heterogeneous subjects which are committed to the preservation of Cultural Heritage,

Phaidra's objective was to be incorporated within the process of cataloguing and digitisation of the objects, defining the necessary requirements so that the digital version of these could be archived in the repository.

The data is delivered and managed in a complete manner. We evaluate the compliance with the archive and with a minimum descriptive and content quality standard.

Phaidra adopts a modified LOM schema (Learning Object Metadata) [49]. Dublin Core metadata is generated from LOM schema (refer to R8 and R12). The ICCD standards for museums are other metadata schemas implemented in Phaidra, Moreover, the Phaidra metadata editor allows the use of terms from thesauri or classifications that are as follows: The ACM Computing Classification System (1998 version), EuroVoc Thesaurus (version 4.2), Dewey Decimal Classification (reduced English edition) and PACS (Physics and Astronomy Classification Scheme). Their use is not mandatory. A new semantic model to describe RDF resources through standard controlled vocabularies and ontologies and the implementation of a vocabulary management system based on SKOS is being developed.

The collaboration with the University Museum System began with the definition and analysis of the types of existing museum assets and their corresponding descriptive metadata, continuing with the implementation of data exportation from the museums' catalogue database and their ingestion into Phaidra, leading to their presentation on the site.

With archives, the analysis of the metadata structure provided in the EAD XML standard was undertaken. Based on this analysis, a procedure was developed that goes through the archive in its logical structure, bringing it back into a structure of collections and sub-collections typical of Phaidra.

For libraries a procedure was designated for the extraction of bibliographic metadata in the (UNI)MARCXML standard from the Library Management System with the purpose of associating the metadata to the corresponding digital objects for bulk upload to Phaidra. The connection to the digital objects in Phaidra can be found in the metadata of the University library catalogue, hence its display in the metadata shared in the national library catalogue and those published in the international WorldCat catalogue of which the libraries of the Library System are members.

During the ingestion phase a validation of the metadata schemas is carried out.

A list of papers on the data models of Phaidra:

C. Bettella, A. Bellotto (2019). Metadata as Semantic Palimpsests: The Case of PHAIDRA@unipd. In "Digital Libraries: Supporting Open Science" Proceedings of the 15th Italian Research Conference on Digital Libraries, IRCDL 2019 (Pisa, Italy, January 31 – February 1, 2019) https://doi.org/10.1007/978-3-030-11226-4_14

C. Bettella, Crosswalk between Phaidra metadata (UWmetadata Profile) and elements in the Dublin Core Element Set: https://phaidra.cab.unipd.it/static/phaidra_dc-metadata-element-set.pdf

L. Andreoli, Y. Carrer, G. Drago, G. Turetta, A. Zane (2018). The user in focus: an inclusive approach to the presentation

of digital collections of GLAM institutions. In "Mitteilungen der Vereinigung Österreichischer Bibliothekarinnen und Bibliothekare" Bd. 71, Nr. 1 (2018)

<https://ojs.univie.ac.at/index.php/voebm/article/view/1983/1906>

L. Andreoli, M. Fornasiero, A. Menegazzi e S. Talas (2018). Defining University museums' objects for the web. In "Turning Inside Out European University Heritage: Collections, Audiences, Stakeholders". Proceedings of the 16th Universeum (Athens, 11-13 June 2015)

http://umac.icom.museum/wp-content/uploads/2018/05/2205_universeum-teliko-screen.pdf

49 <https://phaidra.cab.unipd.it/static/phaidra-uwmetadata.pdf>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

XII. Workflows

R12. Archiving takes place according to defined workflows from ingest to dissemination.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Phaidra's [50] digital environment consists of three main parts: Ingestion, Archival and Dissemination.

The existing workflows refer to these three blocks.

Phaidra's workflow is described on the Organizational Structure page [51].

1. Ingestion

To upload digital objects through the web interface, the so-called Phaidra Metadata editor, the data producer follows the steps defined on the Archive page [52]: log on to Phaidra, set the preferences, choose the file formats, create a single or a multiple object, create a relationship between objects. The Phaidra Guide to archiving (see the recap at the number 8 requirement) describes the procedure in detail.

In accordance with the Guidelines on Digitisation, the Phaidra staff operates a quality check of the data for ingest according to the following criteria:

- the richness of the metadata to satisfy the criteria of documenting the historical, artistic, and cultural heritage of the universities and other collaborating institutions.
- a minimum level of quality and detail of the files to upload (please refer to section 5 of the Guidelines on digitisation)
- clearance on legal issues. In this phase, the Phaidra staff resolves with the data providers possible legal issues, such as copyrights, confidentiality, and anonymization of data. The use of a Creative Commons licence for any digitalised versions of works in the public domain is recommended.
- If a project is not part of Phaidra's mission, the user is directed to the appropriate service.

2. Archival

Phaidra monitors its digital assets, mostly by automated procedures. We carry out an evaluation on the file readability in the future and feasible conversion strategies for long-term storage (virtual machine evaluation, and so on).

The Phaidra staff verifies that all materials and metadata are machines readable in the long-run, including formats that are not recommended, but which are admitted because the conversion keeps the data information with a reference to our designated community.

The digital objects with their metadata, and the relationships that exist between them, are stored in the Fedora platform and organized according to the logic of application of Phaidra, to be made available and searchable through the web interface, available in Italian, English and German. The function of archival storage includes many security mechanisms, such as checking for errors in the information package, evaluation of the preparation of materials for long-term storage. In Phaidra any metadata change is logged by Fedora.

3. Dissemination

The Phaidra website makes all the digital objects (metadata + files) available worldwide. In some cases, the depositors can decide to deposit the digital objects with restricted access, which means that all users can view previews and metadata, but for the master files a request is necessary.

The metadata uses a formal, accessible, shared and broadly applicable language for knowledge representation, such as XML, Json.

The use of APIs [53] allows the transfer of digital resources from Phaidra to other platforms and the integration of objects

and collections in websites and virtual exhibitions, facilitating the dissemination of content. Metadata in the Dublin Core schema is displayed through the OAI-PMH (Open Archive Initiative Protocol for Metadata Harvesting) protocol for the exchange of data in a distributed environment.

50 The Phaidra digital environment: <https://phaidra.cab.unipd.it/info/impressum#techinfo>

51 <https://phaidra.cab.unipd.it/info/impressum#structure>

52 https://phaidra.cab.unipd.it/help_long#archivia

53 <https://github.com/phaidra/phaidra-api>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

XIII. Data discovery and identification

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The Phaidra repository has a simple [54] and advanced search [55]. Search methods are documented on the Help page in the Explore section [56]. The faceted and navigation mode make the search more friendly to all users. The advanced search permits the search of all the metadata with the possibility to use Boolean operators AND and OR.

The data harvest is through the DC-OAI-PMH protocol.

Phaidra collections are published in Europeana [57]

Data citation is possible through XML Dublin Core [58] and XML Phaidra metadata [59]

Citations to digital objects are provided by permanent links. The repository offers Handle as persistent identifier.

A set of public APIs [60] (REST-compliant) used to provide search services, content management of digital objects and sampling and handling of metadata is also available on Phaidra. Anyone who wants to develop an application that presents digital objects in a customised way can freely use these APIs. An example of such an application is the "Collection Viewer", developed for sharing and browsing digital collections in Phaidra in an external site through embedding [61].

54 <https://phaidra.cab.unipd.it/search>

55 https://phaidra.cab.unipd.it/search_object

56 https://phaidra.cab.unipd.it/help_long#3397

57 For example, <https://www.europeana.eu/portal/it/search?q=Iconoteca+dei+botanici>,

<https://www.europeana.eu/portal/it/search?q=tavole+parietali>

58 <https://fc.cab.unipd.it/fedora/get/o:1586/bdef:Asset/getDC>

59 <https://fc.cab.unipd.it/fedora/get/o:1586/bdef:Asset/getUWMETADATA>

60 <https://github.com/phaidra/phaidra-api/wiki/Documentation>

61 For example,

<http://bibliotecavallisneri.cab.unipd.it/collezioni-digitali/zoologische-wandtafeln-von-prof-dr-paul-pfurtscheller>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

XIV. Data reuse

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The Phaidra Guide to archiving explains the descriptive, administrative and structural metadata that is needed for a proper creation of digital objects (refer to section 2.1). There is also a concise guide [62].

With reference to R6, the scientific manager is the discipline expert who takes on responsibility for the selection of the materials and defines and assures the quality of the metadata. In the selection phase, he/she is supported by the project manager, particularly for the examination of the materials and for legal aspects.

The proponent of a digitisation project identifies a scientific supervisor for the disciplinary area of that project.

The approach chosen for possible implementations related to metadata is that of welcoming and assessing the needs of the designated community.

Provenance information is associated with provenance metadata [63].

The digital objects are released with a data usage license (Creative Commons) or a copyright notice. It is recommended to use a Creative Commons licence for any digitalised versions of works in the public domain (please refer to Notes of the Editorial policies [64]).

The export of metadata in XML format is possible in the following formats: Uwmetadata (LOM – Learning Object Metadata schema modified by the University of Vienna), Dublin Core and Museum metadata (Italian Museum Standards of the ICCD - Central Institute for Cataloguing and Documentation of the Ministry of the Cultural Heritage).

Phaidra provides recommendations for preferred file formats for web access in Phaidra. We use preferred file formats for long-term preservation as our guidelines [65].

The selection criteria for formats are openness, security, portability, functionality, development support and dissemination, according to the Agenzia per l'Italia Digitale - Agency for Digital Italy (AgID) of the Presidency of the Council of Ministers [66].

Phaidra aims to follow the principle of readability of the data, which is meant to show and interpret at least the most recent

version of a digital information object at any time. The Phaidra Guide to archiving ensures we have digital objects with clear legible data (refer to section 2).

62 https://phaidra.cab.unipd.it/help_long#3383

63 https://phaidra.cab.unipd.it/help_long#115

64 https://phaidra.cab.unipd.it/help/editorial_policies

65 <https://phaidra.cab.unipd.it/static/EN-file-formats.pdf>

66

https://www.agid.gov.it/sites/default/files/repository_files/leggi_decreti_direttive/formati_allegato_2_dpcm_3-12-2013.pdf

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

TECHNOLOGY

XV. Technical infrastructure

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The basic infrastructure of Phaidra is based on Fedora Commons 3.8.X, one of the most used open source platforms to create digital repositories. Considering the designated community, Phaidra has developed a data model based on LOM, Dublin Core and Italian Museum Standards of the ICCD - Central Institute for Cataloguing and Documentation of the Ministry of the Cultural Heritage) metadata schemas. Fedora follows the OAIS reference model. Fedora and Phaidra are both supported by developer communities. The public wiki of Phaidra documents the technical specifications of the platform (refer to GitHub [67]).

The Phaidra metadata is mostly textual and descriptive. Spatial standards, such as Google KML, are implemented in part. Json and XML are used as exchange formats between platforms and internal components. For low level data security, Fedora's XACML granular permissions ensures that only designated roles and accounts can access the objects and it also performs checks on authorization over modify, creation and deletion. Accounts are managed using Active Directory LDAP.

As regards the connectivity, our provider is the University of Padova, which uses the GARR network [68] the Italian Research network. The University is able to provide and to restore connectivity in a short time. The devices are all equipped with UPS to allow continuity of service in the event of a blackout.

As regards the software, we have developed a Java based utility names "Phaidra Importer" [69] for bulk import of collections of images, documents PDF, videos and books. All the components of Phaidra runs in well-known open source platforms, such as Apache and Ngix, using perl, java, shell scripts and modern web technologies (html5, javascript frameworks, CSS3) for web frontends. We use Debian Linux as operating system for our server appliances.

As regards the storage, Hyperconvergence by VMware is used. This technology aggregates the physical space of our current 6 servers and provides it as a virtual resource for all guests in the VMware system. In this way, the data is distributed on multiple servers and the system is able to continue its functioning, even if a breakdown of 2 servers occurs. In the event of a server failure, it is possible to redistribute the data to the other servers in order to prevent a possible breakdown of a second server. The low-level storage technology is based on raid5 on SSDs.

The documentation is available on GitHub [70]; there is information on Phaidra's technical specifications [71].

67 <https://github.com/phaidra/>

68 <https://www.garr.it/en>

69 <https://github.com/phaidra/java-phaidra-importer/>

71 <https://github.com/phaidra/>

72 <https://phaidra.cab.unipd.it/info/impressum#techinfo>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:
Accept

XVI. Security

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

The Library System has computer staff who manage the information services of the Library System. These are nine computer scientists from the Information systems sector [72] of the Digital Library Office. Two computer scientists from this sector work on Phaidra.

The Library System includes the security of its spaces among its aims. There is a local security officer in the University of Padova's security plan [73], who is able to assess the risks and prevent any dangers. In any case, the safety management is in charge of the University of Padova, which carries out periodic checks for the purposes of risk prevention of the plants, intrusion, manipulation or data theft. The technological infrastructures are in specific places to which only authorized and qualified people have access. In addition to local and remote backups at the University, we have a local tape backup system (LTP3). The tapes are kept in fireproof containers and locked in a supervised room. The technical support for ordinary and extraordinary operations is guaranteed by a special service [74] of the University of Padova.

In summary, the infrastructures are protected by security plans from a physical point of view, as well as being monitored and accessible only by authorized staff. This ensures that the data is safe for long-term preservation and for its use. From an IT point of view, the data is protected by the presence of firewalls that limit the access to the infrastructure. Servers can only be accessed via the local network or via VPN, and access is restricted only to authorized operators with their own account. There are experts that assess the risks of cyber-attacks and we have monitoring tools for the network and the servers.

In addition to the backups, there are internal procedures with instructions for the operators in case of data or infrastructure recovery, and for the regulation of access to systems by authorized staff.

In regards to recovery procedures, if there are any problems on our main IT infrastructure, we can rely on a secondary IT infrastructure and also on the Veeam system, which can put the image back online directly from the backup. We can also recover the image on the University infrastructure, where we already have some other guests running. In the event of a security incident, the issue is reported to Asit [75], a designated office for IT security.

There is information on data preservation [76].

72 http://bibliotecadigitale.cab.unipd.it/chi_siamo/organizzazione-sba/settore-sistemi-informativi

73 <https://www.unipd.it/tutela-sicurezza>

74 <https://www.unipd.it/contatti/rubrica?checkout=cerca&key=AH03000&persona=UFFICIO%20AMBIENTE%20E%20SICUREZZA&ruolo=2>

75 University Computer Center <https://www.ict.unipd.it/>

76 <http://bibliotecadigitale.cab.unipd.it/en/digital-preservation>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

APPLICANT FEEDBACK

Comments/feedback

These requirements are not seen as final, and we value your input to improve the core certification procedure. To this end, please leave any comments you wish to make on both the quality of the Catalogue and its relevance to your organization, as well as any other related thoughts.

Response:

Going through the 16 requirements is a good way to make some useful remarks about the repository and its further improvement.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments: