



APPLICATION OF THE IBiSCo DATA CENTER FOR CULTURAL HERITAGE PROJECTS



USING IBiSCo FOR CULTURAL HERITAGE



- **IDEA**

- Cultural heritage studies nowadays need advanced storage systems, as well as computing resources, to maintain on-line image databases and to allow image analysis and enhancements

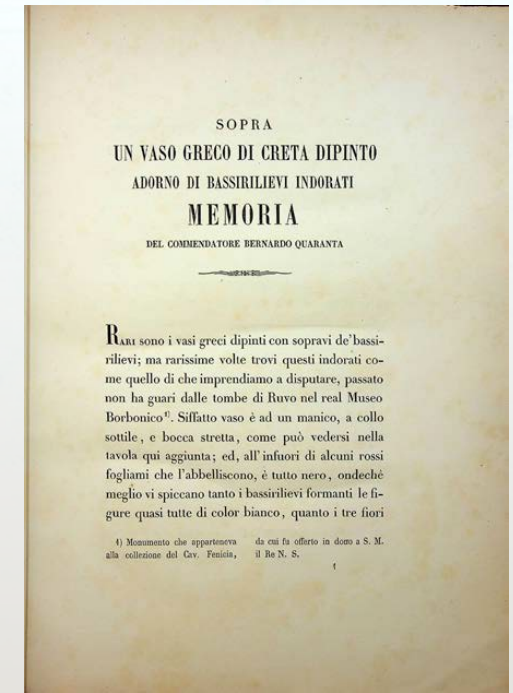
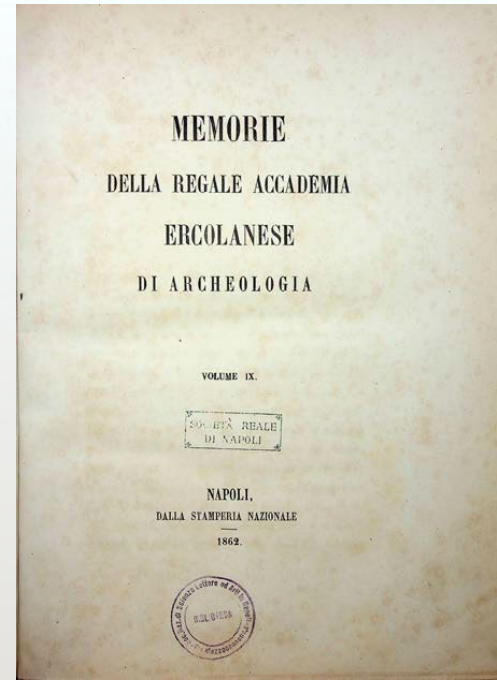
- **WHAT WE HAVE DONE**

- We started using IBiSCo infrastructures to store and analyze images obtained from ancient books
- We started a prototype job with two volumes:
 - “Tristan und Isolde” of Richard Wagner
 - "Memorie della regale Accademia ercolanese di archeologia“

USING IBiSCo FOR CULTURAL HERITAGE



Example results



“Tristan und Isolde” of Richard Wagner

"Memorie della regale Accademia ercolanese di archeologia“



USING IBiSCo FOR CULTURAL HERITAGE

The success of the prototype lead us to present a new project, named MAGIC, which has been funded by the Ministry of Enterprise and Made in Italy, which will continue using the IBiSCo infrastructures

The word "MAGIC" is written in a large, blue, stylized font. The letters are bold and have a slight shadow effect, giving it a three-dimensional appearance. The 'M' and 'G' are particularly large and prominent.





THE MAGIC PROJECT

- **WHAT?**

- A Service Center dedicated to the application of technologies in cultural heritage, specifically for manuscripts, documents, and ancient printed texts

- **WHO?**

- The MAGIC project involves* the collaboration with both public and private* partners:
 1. 3 companies leverage technologies to the enhancement of cultural heritage
 2. Department of Humanistic Studies & "*Ettore Pancini*" Department of Physics of University of Naples "Federico II", as a research organization



THE MAGIC PROJECT

- **WHEN?**

- The Service Center began in May 2023

- **WHY?**

- The Center's goals are:
 1. **PRESERVATION**, for the monitoring the state of the asset and its protection;
 2. **CONSERVATION** through the digital acquisition;
 3. **ACCESS**, for a different use, educational, tourist and research;
 4. **METADATA CREATION**, for the creation of access indexes to enhance search capabilities;

THE VARIOUS PHASES OF THE MAGIC PROJECT



The MAGIC project is divided into 3 phases:

1. Illuminated manuscript codices* of Dante Alighieri's Divine* Comedy;
2. Incunabula and sixteenth century works of the Pontaniana Academy and the Society of Sciences, Letters and Arts of Naples;
3. Manuscripts from the Girolamini Library of Naples;



This is a corpus of manuscripts between the 14th and 15th centuries and preserved in national and international libraries, museums, public and private archives



This is a corpus of 15th and 16th century editions, in particular 6 incunabula and 186 sixteenth century works



This is a corpus of selected incunabula, works of literature, philosophy, theology*, history of the Church and music

THE MAGIC PROJECT'S IMPLEMENTATION GOALS



- The MAGIC Project is divided into 8 implementation goals “Obiettivi realizzativi” (OR). The storage field concerns 2 of the 8 objectives: **OR5** and **OR7**.

Implementation Goal	
OR5 - Prototyping of a storage and distribution system for acquired data	<p>OR 5.1 Creation of the hardware and software chain of the archiving system</p> <p>OR 5.2 Prototyping a back-end interface with acquisition equipment</p> <p>OR 5.3 Prototyping of a monitoring system, including its web dashboard interface</p>
OR7 - Archiving of digitized data	<p>OR 7.1 Image master production system for long time archiving and production of compressed formats of various nature and size compatible with the needs of data distribution and consultation</p> <p>OR 7.2 Interface with the portal and Apps with integration of IIIF protocols and procedures for distribution of acquired images</p>

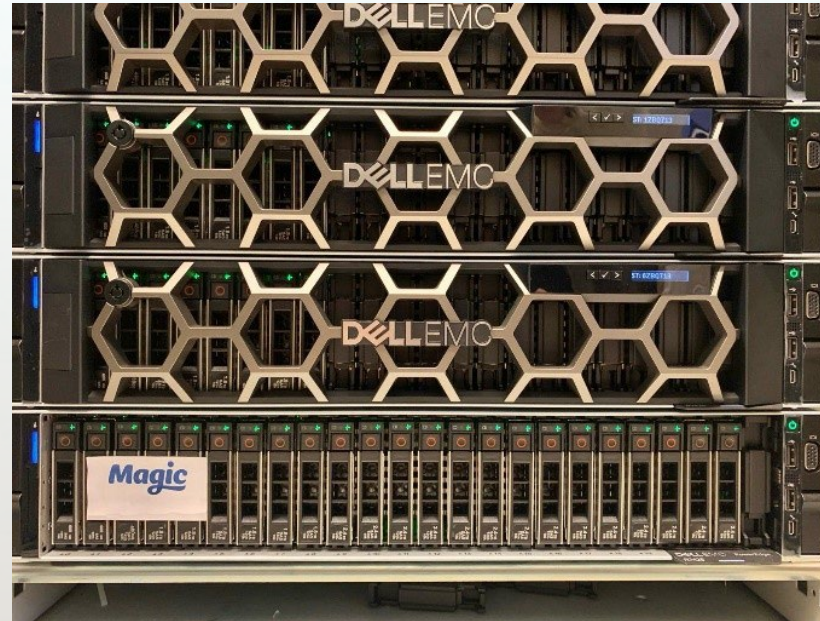
OR5. PROTOTYPING OF AN ARCHIVING AND DISTRIBUTION SYSTEM FOR ACQUIRED DATA



OR5.1. After the digitization activity, a prototype of the archiving system will materialize through the scientific Data Center of the Monte S. Angelo Complex.

It must meet the following elements:

- stability of the service;
- data security and storage;
- image input speed;
- possibility of uploading images even by non-IT personnel;
- rapid consultation of data through a database.



The archiving system will be based on a highly reliable server, located in the Federico II University of Naples.

OR5. PROTOTYPING OF AN ARCHIVING AND DISTRIBUTION SYSTEM FOR ACQUIRED DATA



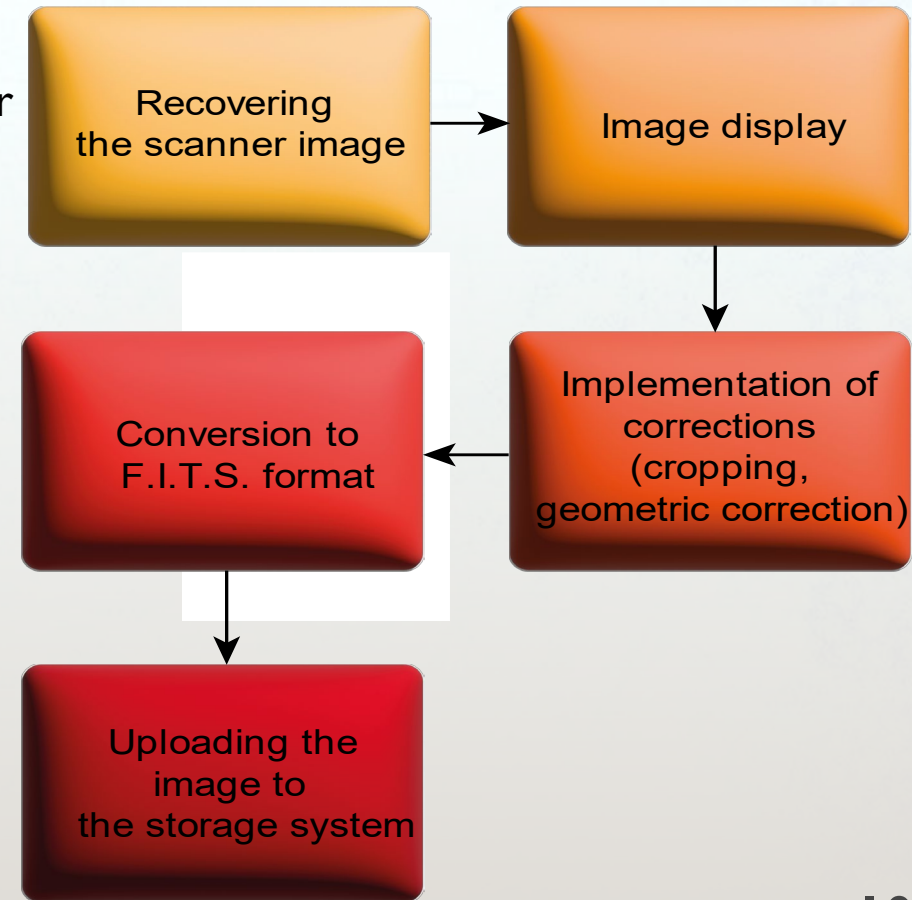
OR5.2. It is essential to set up a back-end interface to transfer the images acquired with the planetary scanner, and the related metadata, via a private server

The project includes images in 3 formats:

- 1) TIFF
- 2) JPG
- 3) F.I.T.S. (Flexible Image Transformation System)

Thanks to the back-end interface it is possible to convert images in TIFF and JPG format also into F.I.T.S. format.

OR5.3. It is necessary to structure a monitoring system to verify the correctness of the archived files, the file formats, the presence of metadata, the evolution of the process of digitization progress and storage occupation



OR7. ARCHIVING OF DIGITIZED DATA



OR7.1.

- A. For each digitized volume, a directory of very high-resolution TIFF images will be produced to create image masters for long-term archiving, so that the book can be permanently archived.
- B. These images will be processed to obtain JPG compressed images for wide consultation, via smartphone, tablet, PC.
- C. These images will be transferred to a special server and converted into F.I.T.S. format.

OR7.2.

Another output interface allows you to generate data flows, for long-term preservation and for image and metadata distribution systems.

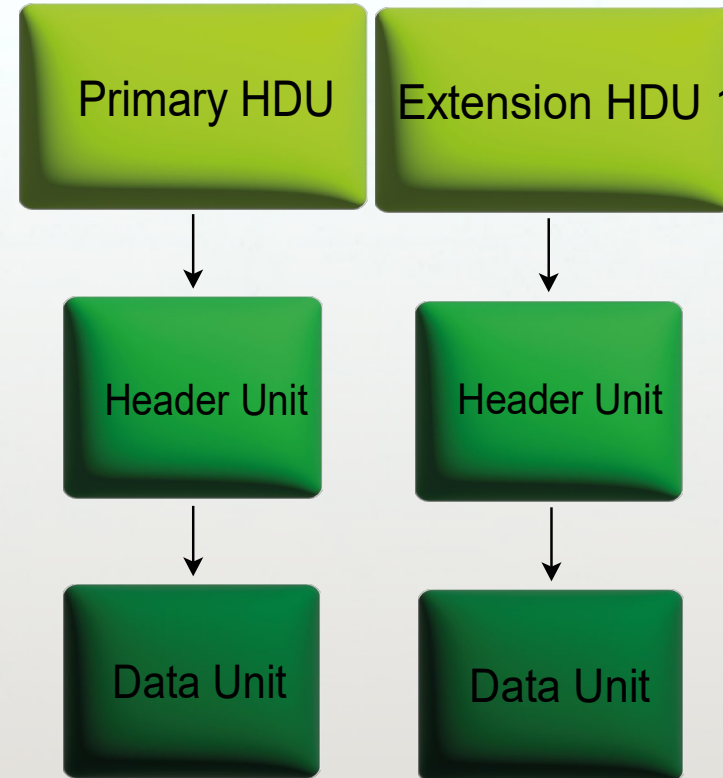
A database, with fixed file names, will facilitate searching.

OR7. ARCHIVING OF DIGITIZED DATA



The F.I.T.S. format, created by NASA in the 1970s, was declared by the Italian Unification Body as a format that guarantees the long-term preservation of digital images (UNI 11845:2022 Standard - "Management processes for the long-term preservation of digital images").

It is based on the "*Once FITS, always FITS*" principle, since the data saved in this format will always be consultable and compatible despite any evolutions of the standard.



The file is composed of:

1. **Header Unit**, which contains information in ASCII characters to facilitate consultation,
2. **Data Unit**.

This structure can be repeated several times for each file.

CONCLUSIONS

- ✓ The MAGIC project is in its early stage
- ✓ We may now use about 100 Illuminated manuscript codices of Dante Alighieri's Divine Comedy (already digitized)
- ✓ Artificial Intelligence activities have just started, and are already being used for quality control
- ✓ It is planned to represent the semantic relationships between the metadata created, through Linked Open Data (LOD) technology and, in particular, through ontological languages (RDFS) to contribute to the real sharing of knowledge



[Thanks for Your attention](#)

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