



SERVICES ASSOCIATED TO DIGITALISED CONTENTS
OF TISSUES IN BIOBANKS ACROSS EUROPE

Publishable summary

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1. PUBLISHABLE SUMMARY

The first periodic report of the BIOPOOL project has finalized the last 30th of August. BIOPOOL is a European collaborative project within the 7th Framework program, aiming at building and providing access to a linked pool of digital data managed by biobanks (comprised by histological digital images of the biologic material and the data associated to these images), demonstrating to its end users (the health community) the potential and the possibilities of this data pool for medical research, diagnosis and educational activities.

During the first 12 months of the project, the established objectives have been achieved. The consortium has been working on the development of the proof-of-concept prototype, which is available at this moment in M12, as it was planned. To achieve this important milestone, it has been necessary to carry out every task in the rest of WPs as scheduled; on the contrary, it would have been impossible to achieve this crucial aim. Briefly, the main works carried out during this first reporting period have been:

- Establishment of the requirements of BIOPOOL system
- Validation plan development
- Design of the architecture of the system
- Core software infrastructure design and development (storage system, communication services, etc)
- Design and development of the first version of the Text Search Engine
- Design and development of the first version of the Image Search Engine
- Design and development of the first version of the web portal
- Integration of the end user's portal, text search engine and image search engine for the proof-of-concept prototype
- Validation by end users of this proof-of-concept prototype

Project content:

For the accomplishment of the objective of the project, the project has been organized into 8 different working packages as shown next:

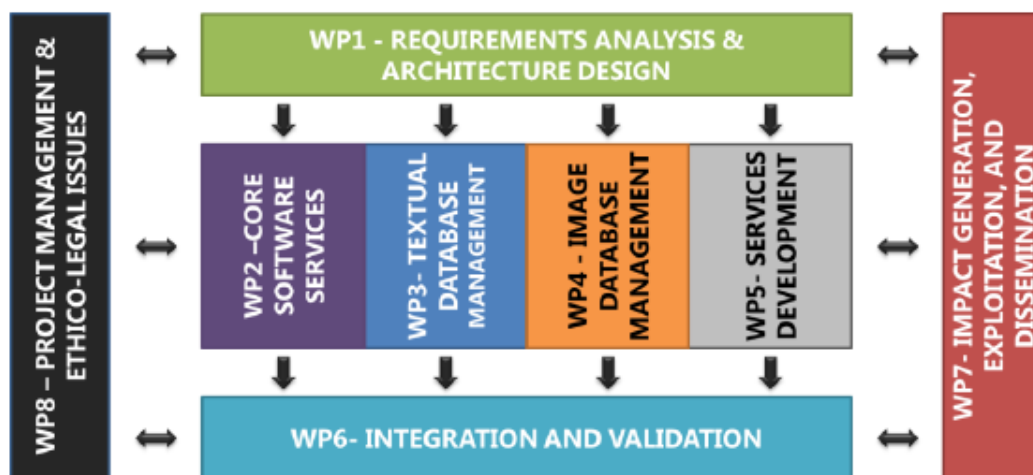


Figure 1 WP description

WP 1 Requirements Analysis and Architecture Design: the requirements to share data and image databases have been established considering the potential users' requirements regarding searching criteria. Besides, the consortium has also defined the requirements of a software client to connect and access to BIOPOOL's network of databases. Finally, based on these requirements the system architecture has been designed. All these results have been used in WP2, 3, 4, 5 and 6.

WP2 Core Software Infrastructure: within this WP the core BIOPOOL platform has been developed. This platform includes different services: for images' format conversion and standardization, compression and decompression services for the extraction and transmission of images, services for the reception and storage of images... etc. In this WP, also the creation of a central index to refer any image of the distributed database, as well as tools to add of new data repositories from biobanks to the datapool, have taken place.

WP3 Textual Database Management and **WP4 Image Database Management** are closely connected, as both of them are related to the management of the databases of the different kind of data the project uses. Also, the hybrid text/image functionality (which will be done during the second year) requires a close collaboration in these two WP. **WP3** comprises tasks related to text-based search. Within this WP, it has been defined also the structure of the text database with data associated to the histological images. **WP4** has dealt with issues related to image based indexing and searching. In order to achieve WP4 objectives, multi-scale imaging descriptors capable of modelling the samples have been defined and extracted by means of specifically developed algorithms. Besides, a system capable of associating those descriptors and search histological images by means of them has been developed. During the second period of the project the hybrid image/text search module will be tackled in both WP3 and WP4 at the same time, in order to combine properly the scoring results coming from both indexing modules. Moreover, the text and image search engine functionalities will be enhanced and completed in WP3 y WP4. In this regard, the data pool will be enriched with extra samples belonging to lung and breast pathologies, which means descriptors and search engine tuning for these new kind of histological images.

WP5 Service Development: it has been developed the interface for the end users of the BIOPOOL system, including the different functionalities to search images in the pool, compare samples, visualize and process images to detect and segment zones of interest and to view the histological images of samples before orderings etc..

WP6 Integration and Validation: this WP will be carried out in two main phases. During the first period of the project, the proof-of-concept (PoC) prototype to integrate and validate the set of core functionalities that have been firstly developed, has been defined. This PoC has allowed checking the consistency of the system architecture and the service frontend. During the second phase, the overall system integration and validation will be done.

WP7 Impact Generation, Exploitation and Dissemination: within this WP, three different but inter-related objectives are being addressed. Firstly, the consortium has been carrying out impact generation tasks, to show to the biobanking community, related industry and

scientific community and other stakeholders the potential of BIOPOOL. Besides, a first version of the Exploitation Plan has been developed. Furthermore, dissemination activities have been oriented to achieve highest possible visibility, presenting the progress of the project to stakeholders and general public. In this point, it is worth mentioning the development of press releases, workshops attendances, etc. Finally, the necessary measures to ensure that the BIOPOOL data pool size will be increased have been taken.

WP8 Project Management and Ethic-Legal Issues Evaluation: this WP has been dedicated to management duties, and to address all the ethical and legal requirements related to the project activities, such as guaranteeing the preservation of the data of the patients, and assure that their anonymity (and any other) is preserved.