Website Project
## Contents

1 Introduction ................................................................................................................................. 2
2 Objectives and structure of the document .................................................................................. 2
3 Methodology .................................................................................................................................. 2
   Internet domain .......................................................................................................................... 3
4 Website structure and contents ...................................................................................................... 3
5 Design .......................................................................................................................................... 11
6 Conclusions ................................................................................................................................... 12
Appendix: selection of subcontractors ............................................................................................ 12
1 Introduction

The aim of BIOPOOL website is to offer an overview about the project, its objectives, progress and results, partnership and their contacts. The website will show up-to-date information on intermediate and final project results, also in the form of public reports and publications. Besides guaranteeing visibility of the project to the market and institutions, the website will also help the partners to interact with each other, through the creation of a reserved area, protected by password.

2 Objectives and structure of the document

This document will describe the technical specifications, contents and design of the BIOPOOL website. The rest of the document is structured as follows. Section 3 describes the methodology; Section 4 shows the structure and contents of the website, while Section 5 illustrates the characteristics of the web design. Finally, Section 6 concludes.

3 Methodology

BIOPOOL website will be developed using Drupal open-source content management system (CMS) and web application framework. Drupal is written in PHP, distributed under the GNU General Public License and it runs on any server that supports both a web server capable of running PHP and a database (such as MySQL) to store content and settings. To meet the project needs, CMS will be integrated with custom modules and an original template. Given that Drupal isolates core files from contributed modules and themes, it will increase flexibility and security and will allow administrators to cleanly upgrade to new releases without overwriting their site customizations.

One of the CMS strengths is that modules, themes and database are separated, so it is easily possible to take the following actions without influencing the whole website functionalities:

- Edit or update the theme
- Update CMS core files and/or modules
- Migrate the database into another CMS.

Drupal’s strength stands also in its open-source nature: for everything the system can do, the code is available and editable, so that there is no developer dependency. By contrast, other programming languages are secretive about their hidden source, and about what makes them in fact work, which makes you depend on what the developers tell about it.
We observe that BIOPOOL website can be accessed not only via computer, but also via smartphones and other handheld mobile devices. However, due to budget constrains we will not adopt responsive web design to optimise the view of our website in mobile devices.

**Internet domain**

To increase hit rates, BIOPOOL website will have the following internet domains: www.biopool.org and www.biopoolproject.eu.

### 4 Website structure and contents

In structuring the site we aim at finding an optimum number of links and headings. Indeed, while an excess of menus will prevent easy access to information, we recognise that overload of information in few headings will make the structure too condensed.

We note that the footer of all pages in the website will provide links to the project social networks accounts Twitter, Facebook, and LinkedIn.

In the following we describe the contents of the various pages in BIOPOOL website.

**Homepage**

*This page provides the following non-technical description of the project:*

The aim of BIOPOOL is to enable biobanks to build a network that links collections of histological digital images of biologic material and associated information managed by biobanks. It will also develop services for exploitation of this network, such as text and image based search queries, region-of-interest extraction and automated pathology information extraction for specific types of cancers. The use of such interconnected source of data has great potentials for medical research, diagnosis and educational activities. BIOPOOL will enhance pathology research by reducing diagnosis time and related costs.

*The page will also provide acknowledgment to the EU co-funding by including the EU and FP7 logos, links to EU and FP7 websites, and a sentence stating that “Project funded by the European Commission’s Seventh Framework Programme”. Please see the guidelines for details on how to link EU and FP7 websites.*

*The page will display two images, a histological image and an image of a microscope.*

**Project Overview**

*This page provides the following description about the project:*
BIOPOOL project is a unique initiative to build a large collection of histological images and associated data and to develop a fully operational IT system able to retrieve, search and exploit these images with advanced functionalities. BIOPOOL project will start with the aggregation of data available from eight biobanks.

**BIOPOOL objectives**

- To provide tools for the interconnection of different biobank digital resources, using standard communication protocols. The use of these protocols will allow acquiring, storing and exchanging images and associated data.

- To build an integrated pool of digital images, and provide tools for the harmonization of data from different biobanks throughout Europe. The project will use storage formats such as OME-XML, OME-TIFF, that are compatible with existing systems. In order to include already existing images, auxiliary modules will be developed to convert images into standard formats.

- To develop and provide tools for the management and exploitation of digital data. BIOPOOL project will provide improved access to digital data, and offer services for exploitation of these data, such as text and image based search queries, region-of-interest extraction and automated pathology information extraction for specific types of cancers.

**The challenges**

BIOPOOL project involves a significant number of challenges, both technical and non-technical:

- The management of large images and their display speed: digitalised bio-images are stored in huge files, even reaching 10-15 GB per image.

- The comparison between different images of the pool is very complex due to different scales and formats of images, and the biological variability of samples. The system will have to minimise these effects on images and be able to compare them in the same “normalised conditions”.

- Scalability problems and different acquisition protocols for different types of tissues. Novel imaging descriptors and scoring methodologies will be developed in order to cope with this variability. These will also permit faster access and search of images.

- Ethical and legal issues. Sharing personal related-images anywhere in the world implies different legal issues. This is why the services to be developed in BIOPOOL will ensure compliance with data protection and other privacy legislation.

**Project reference:** 296162
**Duration:** September 1, 2012 to August 31, 2014

This page also include the Factsheet in downloadable pdf file.

**Consortium**

This page will contain the following clickable list of partners with their web link and logos

BIOPOOL consortium is composed of an interdisciplinary group of experienced partners with complementary roles:

Fundación Vasca de Innovación e Investigación Sanitarias  [http://www.bioef.org](http://www.bioef.org)


Emedica SL  [www.emedica.es](http://www.emedica.es)

Pertimm (Pertinent et Immediat) SAS  [www.pertimm.com](http://www.pertimm.com)

Brunel University  [www.brunel.ac.uk](http://www.brunel.ac.uk)

Erasums MC Tissue Bank  [www.erasmusmc.nl/?lang=en](http://www.erasmusmc.nl/?lang=en)

Cultek SL  [www.cultek.com](http://www.cultek.com)

The following map showing the geographical distribution of the participating institutions will also be included in this page:

![Geographical distribution map](map.png)

**Management Structure**

This page will show the following text:
BIOPOOL consortium is characterised by a simple hierarchy that ensures fast decision taking and a smooth project management, while providing the necessary control and participation mechanisms. Given the small size of the project, special care has been taken to keep the structure and decision making procedures as basic as possible, without sacrificing effectiveness.

The management structure of the project is presented in the following figure:

Add the figure in a clickable format that lists the different committees, and each of their members:

![Management Structure Diagram]

The project **Coordinator** is Roberto Bilbao from BIOEF. He is in charge of supervising the management of the project on a day to day basis, deciding on any actions necessary to correct potential deviations from the project plan, both operational and financial. The Project Coordinator is also the contact point of the project with EC.

The **Management Committee** is formed by a representative of each of the members of the consortium, and chaired by the coordinator Roberto Bilbao. The Management Committee provides the overall direction of the project and the necessary relevant strategic guidelines, thus ensuring the good overall results of the project.

The **Technical Committee** is in charge of supervising the work programme implementation, being responsible of taking all decisions related to the project operational management. The TC is constituted by the Technical Coordinator and the Work Package Leaders. The TC will meet every six months, although special meetings may be called to meet the project requirements.

**Scientific Methodology and Work Packages**

*This page describes the overall scientific methodology*

BIOPOOL will provide the following services and functionalities:

**Data sharing and retrieval**: The system will allow its users sharing and downloading the images stored in the different nodes of the data pool. It will be
possible for any BIOPOOL user accessing the images and data stored in any of the nodes connected to the system, no matter where they are physically.

**Image Visualization:** the system will allow viewing the images stored in any of the databases of the linked pool of data. An advanced platform will be provided for viewing and treating images (compress, decompress, convert, send, harmonize…).

**Advanced Data Search:** The system will provide advanced data search functionalities from the linked pool of biological images stored in the biobank databases, based on comparing and scoring the images and their associated data stored in the data pool according to the data provided as a search query.

In this page, a “Help guide & demo” will be included, to show how the images handled by BIOPOOL look like and how are compared. A set of images will be included.

This page also describes the work package breakdown. In particular, links to the various WP with their WP leader (and link to partner in the consortium page), and description will be provided.

**WP1: Requirements Analysis and Architecture Design.**

**WP Leader:** Roberto Bilbao from BIOEF

**Description:** This WP will declare the requirements to share data and image databases, based on the potential users’ requirements regarding searching criteria. Also, it will define the requirements of a software client to connect and access to BIOPOOL’s network of databases. Finally, based on these requirements the systems architecture design will be carried out.

**WP2: Core Software Infrastructure**

**WP Leader:** Elena Muñoz from Emedica SL

**Description:** This WP will develop the core BIOPOOL platform, which 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. The WP also includes the creation of a central index to refer any image of the distributed database, and tools to add of new data repositories from biobanks to the datapool.

**WP3: Textual Database Management and WP4: Image Database Management**

**WP Leaders:** Patrick Constant from Pertimm (Pertinent et Immediat) SAS and Arantza Bereciartua from Fundación Tecnalia Research & Innovation
Description: WP3 and WP4 are closely connected, as both of them are related to the management of the databases of the different kind of data this project uses. Also, the hybrid text/image functionality requires a close collaboration in these two WP. In WP3 there are tasks related to text-based search. The structure of the text database with data associated to the histological images will be defined. This data, which can be in a wide variety of formats, shall be efficiently processed, and it will be ensured that new formats can be easily integrated. Indexation and text based search modules will be set up, with strong emphasis in semantic concepts. WP 4 deals with issues related to image based indexing and searching. Multi-scale imaging descriptors capable of modelling the samples will be defined and extracted by means of specifically developed algorithms. Also, a system capable of associating those descriptors and search histological images by means of them will be developed. When no results can be provided, the pathologist will have the opportunity to train the system, manually scoring the images based on their proximity to their query, providing professional feedback to the indexing module that will take this score into account for future searches. 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.

WP Leaders: Elena Muñoz from Emedica SL

WP5: Service Development

Description: This WP will develop 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, to view images before orderings, etc.

WP6: Integration and Validation

WP Leader: Pieter H.J. Riegman from Erasums MC Tissue Bank

Description: This WP will be carried out in two main phases. The first phase will define a proof-of-concept prototype to integrate and validate the set of core functionalities and content that will be firstly developed in the project, checking the consistency of the system architecture and the service frontend. The second phase will make the overall system integration and validation, integrating and validating all the BIOOOL components developed in previous WPs, providing the complete set of BIOPOOL functionalities.

WP7: Impact Generation, Exploitation and Dissemination

WP Leader: Francesco Moscone from Brunel University

Description: This WP has three different but inter-related objectives. There will be impact generation tasks, to show to the biobanking community, related industry and scientific community and other stakeholders the potential of BIOPOOL. The
exploitation activities are aimed at taking profit of the impact activities, using the feedback obtained through them to update the business case and create and exploitation plan. Finally, Dissemination activities are oriented to achieve highest possible visibility, presenting the progress of the project to stakeholders and general public. Another objective of the WP is to take the necessary measures to ensure that the BIOPOOL data pool size will be increased.

**WP8: Project Management and Ethic-Legal Issues Evaluation**

**WP Leader:** Roberto Bilbao from BIOEF

**Description:** This WP will be 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.

*The page will show the following graphical representation of how the different work packages are linked:*

![Graphical representation of work packages](image)

As well as the following graphical representation of the scope and relation between RTD work packages.
Deliverables and Publications

Left blank

Reserved area

This section can be only accessed via login and password and will display links to the following pages:

- Grant agreement: this page will contain documentation relative to the grant agreement (the proposal, the grant agreement, etc.)
- Deliverables info: this page will include the list of deliverables to be submitted for review to EC, with their timetable.
- Deliverables revisions: In this page it will be possible to upload provisional versions of the deliverables
- Forms and templates: In this page it will be possible to download templates for project progression and other forms.
- Other material
- Meeting minutes
- Project contacts

News and events

Left blank

Media Centre

Posters/slides and other dissemination material will be uploaded in this page
A Newsletter will be soon created with update on the progress of the project.

The Project factsheet will also be uploaded in this page.

Links

www.cap.org

Contacts

The following contact details are added to this page:

For more information, please write us at info@biopool.org or contact the project coordinators:

Dr. Roberto Bilbao
Project coordinator
Tel:+34-944536888
Fax:+34-944530465
e-mail: bilbao@bioef.org

Dr. Oihana Belar
Technical coordinator
Tel:+34-944538500
Fax:+34-944530465
e-mail: obelar@bioef.org

5 Design

According to the project requirements, the template web design will have the following characteristics:

- Easy to use for end-users, with no training required
- Show the information to the user in a clear and concise way
- Remove any ambiguities regarding the consequences of an action
- Place the most important items in an appropriate area of the web page
- Have both HTML and CSS code valid (passing W3C validation tests)
- Be search engine optimized (SEO).
6 Conclusions

This webpage will maximise the visibility of our project, with the ultimate aim of boosting the impact of BIOPOOL on different sectors of the society, ranging from the scientific community to the business environment.

Appendix: selection of subcontractors

Taking into account the specific characteristics of the website, its development requires the subcontract of a web designer. The beneficiary of the subcontract has been identified following the best value for money criterion, and is a private identity.

The table below shows a description of the tasks to be subcontracted together with a financial estimation of the costs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-source CMS site development, including custom template, search</td>
<td>€ 1850</td>
</tr>
<tr>
<td>engine optimized (SEO) code, stats service, admin control panel,</td>
<td></td>
</tr>
<tr>
<td>user content management, social network integration</td>
<td></td>
</tr>
<tr>
<td>Creation of a reserved area module (enabling the view of dedicated</td>
<td>€ 300</td>
</tr>
<tr>
<td>contents) and registered user management</td>
<td></td>
</tr>
<tr>
<td>Purchase of the internet domains</td>
<td>€20 + €25 per year for 4 years</td>
</tr>
<tr>
<td>Server</td>
<td>€ 120/a year for 4 years</td>
</tr>
<tr>
<td><strong>Total estimated costs</strong></td>
<td><strong>€ 2810</strong></td>
</tr>
</tbody>
</table>