Ten Projects
Horizon 2020 for Cultural Heritage
Pre-Kick Off Meeting

POMPEiiLAB
Project

Second draft, March, 2015

A.I.C. – Associazione Investire in Cultura

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B - TECHNICAL ANNEX

COVER PAGE

Title of Proposal: 3D Vesuvius landscape reconstruction

Acronym: POMPEIILAB

List of Participants:

Participant No *	Participant organisation name	Country
1	X	X
2	Y	Y
3	Z	Z
4	W	W
5	K	K
6	K	K
7	K	K
8	K	K
9	K	K
10	S	S
11	L	L
12	A	A
13	O	O.

Table of Contents

PompeiiLab
"3D Vesuvius landscape reconstruction"

1 – Excellence

1.1 – Objectives

The landscape is a tool through which we can view our reality, initiating a process of rebuilding our contemporary identity. It allows us to position ourselves in the world, to relate to our history, to let us feel "living together".
The landscape is intimately linked to the possible relationship with the man and the natural events which shape its look. Traditionally, the approach to the landscape reveals the identity of individuals who live in contact. Everyone watching from a personal perspective, the result of a set of human, aesthetic and scientific relations. Today the landscape acts as a tool to understand the signs of our lives. Past and present.
It, directly or indirectly, inspires our common life.
In this context, the project PompeiiLab aims to reconstruct and describe the past history and the contradictions of the modern Vesuvius landscape.
More specifically, the history of the archaeological site of Pompeii, with its presence of ancient area in a contemporary landscape. The evolution of the landscape is in fact deeply linked to the evolution of civilizations that occupied or abandoned it, according to the catastrophic natural events of different times.
The scientific data that will be obtained by geological, archaeological, anthropological, botanic, and historical researches, and from the study of agricultural techniques, as well as by several three-dimensional models of the landscape in different historical periods; they will provide the opportunity for scholars, students, and ordinary citizens to learn about the history of the place in which they live, by means of a popular and creative model.
The reconstruction of a three-dimensional landscape will be connected to a soundscape, an olfactory contribution, and an explanation of the places.. An entertainment space dedicated to the enjoyment will welcome visitors through three-dimensional installations that allow observing the sites and their subsequent transformations over time. Sound systems will talk about the natural features and the presence of man. The visit will be brought forward by a didactic section, provided in several languages, preparatory to the visit.
This installation may be taken as a high-definition demonstration prototype that can be employed for other archaeological sites and museums.

1.2 – Relation to the Work programme

The work programme topic to which PompeiiLab relates is Reflective 6 – 2015 because the proposal fulfils the Call reguirements, ie.:

Code 1 (to be written once all Work packages are ready)

1.3 – Concept and approach

Code 2 (to be written once all Work packages are ready)

(Describe the overall project starting from the activities of WP2, WP3, and WP4: their approach, methodology, etc. and any national or international research linked to this project).

1.4 Ambition

Code 3 (to be written once all Work packages are ready)

(Describe for the overall Project, i.e. for the activities reported in WP2, WP3, and WP4:

1 - the state-of-the-art

2 – the progress beyond the state-of-the-art

3 – the literature concerning the previous points)

2 – Impact

2.1 –Expected impacts

Code 4 (to be written once all Work packages are ready)

(Describe how a lasting impact of the Project will be ensured by the following strategic Project choices):

……..

(In particular, describe the following Project outcomes that will become available in a practical use):

……..

2.2 –Measures to maximize impact

Code 5 (to be written once all Work packages are ready)

a) Dissemination and exploitation of results

Preparation of a draft plan for dissemination of project results

All Partners will prepare items for publication (scientific papers, conference abstracts, website updates, etc.). Full details about how to publish Project results are outlined into the Consortium agreement.

b) Communication activities

All partners will describe, according to their opinion:

- Market impacts of the project
- Market size and potential
- Steps towards commercialization
- Necessity of a European approach

3 – IMPLEMENTATION

3.1 Work plan - work packages, deliverables and milestones

Code 6 (to be written once all Work packages are ready)

(Describe the overall Work Plan based on the activities of the five Work packages.)

Timing of the Work plan (Gantt chart)

Inter-relation of the components (Pert chart)

The following five Work Packages: WP1, WP2, WP3, WP4 and WP5 represent the structure of this Work plan

Table 3.1a: Work package WP1 description

Work package number 1		**Start Date or Starting Event**					
Work package title							
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

This WP guarantees that:

- an effective coordinating structure is created
- the research project is carried out according to the time schedule and budget established,
- meetings are organized to enable collaboration and management of consortium partners,
- the project progress of the WPs is managed and monitored against contractual deliverables,
- the WPs objectives are achieved efficiently,
- a system is created to provide a continuous evaluation feedback and a constant project monitoring.
- the project is managed according to the contract between the POMPEIILAB consortium partners and the EC, maintaining a continuous link with the EC, and the overall legal, contractual, ethical, financial and administrative management activities are performed ensuring accurate and timely distribution of funds, reporting on activities, etc.).

Description of work

WP 1 is the Coordination Work Package, which will last for the whole duration of the project.

1 - Coordinator

The responsibility of the project coordination will be taken by …… who will supply the Project Coordinator. The project coordinator is responsible for all deliverables.

The coordinator's main activities concern the monitoring and management of the agreed deliverables and milestones in the contract between the consortium and the EC, and the smooth running of the project as a whole. The coordinator will maintain continuous relationships with the General Assembly including the Work Package leaders and will report to the EU. For the day-to-day project management, the Project Officer (PO) supports the coordinator. She/he will focus on the daily management, coordination and administrative and financial aspects of the project.

Coordinator activities:

a) Kick Off meeting.

Upon signature of the contract with the European Commission, the project coordinator will organize an initial kick-off meeting for all personnel involved in the project. This kick-off meeting will enable the participants to obtain a better perspective of their role in the POMPEIILAB project. Prior to concluding the contract with the EC, a Consortium Agreement will be signed between the project partners

b) Process Management tasks.

The Project Coordinator will conduct the overall project management, as specified in the contract between the consortium and the EC, i.e.:

- Organize the project meetings, workshops, and receive reports;
- Oversee the drawing up and timely signing of the Consortium Agreement;
- Ensure that all parties will sign the contract with the EC on time;
- Initiate, prepare and preside over regular project progress meetings and the dissemination of information to all partners pertaining to these meetings;
- Act as liaison to the European Commission on behalf of the group in all verbal and written communication;
- Inform the Commission properly about the situation and progress of the work;
- Inform the Commission in advance of the date and subject of the meetings;
- Coordinate the overall financial, administrative and contractual activities of the project, including monitoring and maintaining the overall adherence to the financial budgets;

- Report the overall budgetary situation of the project to the EC, based on the cost declarations from the individual partners;

Coordinate the dissemination of knowledge and deliverables.

3 - Operational project management

The consortium agreement and contract conditions with the EC will be monitored by the General Assembly to ensure compliance by all participating parties.

For each work package, a WP leader has been appointed to take primary technical control of and responsibility for the proper management and execution of the tasks related to the particular WP. He/she establishes (in co- ordination with the Project Coordinator) the detailed schedule of his/her WP. He/she is also responsible for the quality of, and the correct and timely submission of deliverables relating to his/her WP. Each WP leader is also appointed to chair the meetings among the partners participating to his/her WP and will communicate frequently both formally and informally with the workers in the WP.

4- Monitoring:

a) Internal reporting

In order to monitor and guide the consortium, each individual partner will regularly (after the first four months and thereafter at four-monthly intervals) submit a progress report to the respective Work Package leaders. On the basis of these reports, the WP leaders will monitor progress and take any necessary action to ensure the work package remains on schedule.

Each WP leader is required to provide the PC regularly (after four months and thereafter at four monthly intervals) with a progress report concerning his/her WP and containing sufficient technical information to enable the PC to be assured that work is progressing according to plan.

The status of the project will be updated by the PC in a Project Dashboard that will highlight all key progress indicators of the project and areas at risk.

b) External reporting

The combined WP reports (task of the PC) will be discussed and evaluated during meetings of the General Assembly and will constitute the interim reports and form the basis for the annual and final reports that will be submitted to the European Commission by the PC.

Based on the EU model format the coordinator will ensure that all partners provide a consistent flow of information containing key points on the financial progress in the form of a financial report and associated financial plan, as well as an activity report and updated implementation plan.

c) Internal communication

A communication plan will be agreed upon by the General Assembly at the kick-off meeting and will define means and methodology of communication among the project partners.

5- Financial / administrative management

The Project Officer of …… will ensure that all budgetary actions are performed according to the rules and regulations of the EC and the consortium agreement. This includes amongst others establishing a good operating practice for financial management adapted to the financial system of each participating party, to ensure that the received funds are correctly distributed, accounted for, cost statements are received.

Deliverables

– ***Consortium Agreement.*** A Consortium Agreement will be concluded among the project partners.
– ***Kick-Off meeting minutes.***
– ***Meeting/workshop minutes.***
– ***General Assembly meeting minutes.***
– ***Internal website with public areas for communication and data sharing***
– ***Partners progress report.*** Each individual partner will regularly submit a progress report to the respective Work Package leaders in order to monitor progress and to ensure the work package remains on schedule.
– ***Work Package progress report.*** Each WP leader is required to provide the PC regularly with a WP progress report concerning his/her WP to enable the PC to be assured that work is progressing according to plan.
– ***Interim reports.*** The PC will combine the WP progress reports and will constitute the interim reports.
– ***Progress reports to the EC.*** Annually the PC will submit progress reports to the EC.
– ***Final report (technical, financial, deliverables).*** The PC will submit the final report to EC.

Table 3.1a: Work package WP2 description

Work package number 2		**Start Date or Starting Event**					
Work package title: Reconstruction of Pompeian territory	**Reconstrucion of Pompeian territory**						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

(Tsakiri) The Athens Partner will participate in the WP2 with an aim to perform 3D data acquisition for the accurate documentation of the Pompeii landscape in its present state using state-of-the art geodetic technologies and create a three-dimensional model of the Pompeii landscape in its present state.

- Three-dimensional data acquisition for the accurate documentation of the Pompeii landscape in its present state using state-of-the art geodetic technologies;
- Creation of a three-dimensional model of the Pompeii landscape in its present state;

(Tsakiri)

Description of work

(Tsakiri) In order to create a 3D representation of the current landscape a combination of state-of-the art geodetic technologies will be employed. Specifically, surveying, photogrammetric and terrestrial laser scanning techniques will be used. The initial data acquisition will be performed using a UAV (unmanned aerial vehicle) platform. Aerial photos covering the entire area of interest will be acquired. Using state-of-the art photogrammetric techniques, a dense point cloud will be produced. In this area, algorithms regarding the processing of the digital images using dense image matching techniques will be developed. The algorithms will also enable real-time operation in order for the remote user to have the ability to see the produced cloud point of the mapped site. In addition, several terrestrial laser scan acquisitions will be executed in order to cover occluded areas. The resulting point clouds will be fused together with the point cloud derived from photogrammetry. One of the system's novelty is the use of a range camera which is extremely useful for providing extra information for accelerating the dense image matching implementation. Finally, a triangulated mesh will be created that will provide a detailed 3D representation of the Pompeii area (landscape and buildings). The point clouds and the 3D meshes will be serving as the basic infrastructure for any subsequent analysis.

There are five key milestones (ML) for this part of the project (m stands for month) as follows:

ML1 - 1st m: Project Start
ML2 - 2nd m: Technical specifications and design of the data collection system e
ML3 - 8th m: Field work for the geometric recording of the Pompeii landscape
ML4 - 12th m: Processing of data and production of 3D models
ML5 - 13th m: End of this part of project - deliverables

(a) Technical specifications and design of the data collection system

- Design (hardware, logistics, methods and processing tools) of the integrated recording system (digital cameras, GPS/INS, range camera)
- Definition of accuracy specifications

Outcomes: Description of the integrated system for cultural heritage documentation system

(b) Field work for the geometric recording of the Pompeii landscape

- Acquisition of data using UAV platforms
- 3D terrestrial laser scanning
- Use of geodetic techniques to provide global reference system and control reference

Outcomes: Data base of the acquired raw data

(c)Processing of data and production of 3D models

- Software development of dense image matching processing techniques
- Fusion of photo images with terrestrial laser scanning and range camera data
- Integration of clouds
- 3D surface models

There are six (6) key milestones during the project (m stands for month) (Tsakiri)

Deliverables

(Tsakiri) The deliverables from this part of WP2 are the following:

- Point Cloud representation
- Full textured 3D Mesh, in several level of details
- High resolution digital orthophoto
- Aerial and terrestrial panoramic photos (Tsakiri)

Table 3.1a: Work package WP3 description

Work package number 3		Start Date or Starting Event					
Work package title	Archaeological & botanic researches						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

(Gaetano Di Pasquale)
The main objective of our work will be to give a very precise picture of the past vegetation landscape, both in the natural and agrarian fields with special attention to man and plant landscape interaction.
Diachronic reconstruction of the land use will be achieved with appropriated methodologies depending to the investigated time.
Concerning the present landscape the attention will be addressed to the rural landscape mainly from a historical and cultural perspective and will be aimed to detect survival of ancient landscapes referable to their historical, geographic and cultural origin.
(Gaetano Di Pasquale)

(Sebastian Glende)
YOUSE could realize the whole part of user-centred-design, development of acceptance and the integration of different user and stakeholder groups.
Thus, different persons will be involved for interviews and creative workshops, to find out, what requirements and needs these different groups have. This includes an integration of the following and more stakeholder groups:

- tourists
- organizational staff for the site
- municipalities or tourist authorities

The stakeholder integration ensures that the project aims and work is planned in a way that is seen as a big benefit from the point of view of the people/stakeholders involved. This way we ensure that the results are really something the people need and are happy with. And this again ensures, that the final result of the project is really used in everyday life and accepted. **(Sebastian Glende)**

(Danti) Plants are fundamental elements in landscape. Their presence and development largely depend on the environmental parameters, as well as on human activities that have a fundamental role in shaping the landscape. The study of the current flora and vegetation and their changes from the Roman Period to the present-day aims to improve our knowledge about the evolution of the cultural landscape in the Vesuvian area and to reconstruct the human environment, both as evolution and status quo.
In addition to the palynological researches, the remains of plant pathogenes will be studied, with the aim to investigate on crop diseases which could have affected the ancient cultivations**. (Danti)**

Description of work

(Gaetano Di Pasquale) (Botany- agronomy-archaeobotany)
Plant history both in the wild and in the agricultural landscape can be traced on different time scales: the analysis of plant remains from archaeological sediments or from natural soils allows this kind of study to be carried out up to millennial scale, the study of archival documents up to few centuries, diachronic analysis of historical maps, aerial photos, satellite images and study of actual field data allows to gather information up few decades.
In this area, the study of botanic material (namely archaeobotany) mainly coming from the areas covered by the 79 AD eruption has been having for decades a prominent role in defining the features of the natural landscape, of the agricultural activities, the food consumption, timber use, gardening etc thanks to the exceptional preservation of much organic materials due to the pyroclastic deposits of the Vesuvius eruptions. Other scattered researches were carried out in a wider area comprising the northern side of the Vesuvius volcano and allowed to reconstruct the Late Antique period too.
The first phase our work will be to collect all the existing archaeobotanical data by analysing and combining them in a systematic and diachronic way in order to get a new overview of the agricultural landscape and forestry.
Concerning the present day and the more recent centuries regressive analysis of the landscape will be done trough historical ecology approach. Further data will be obtained by the study of traditional crops already present in the study area.
Additional information will be achieved by the historical collections dealing the traditional crops of the Vesuvius area (depictions, botanical specimens, artcrafts) stored in The Museum of Agricultural science (MUSA) of the University of Naples Federico II. **(Gaetano Di Pasquale)**

(Sebastian Glende) The detailed description of work has to be planned in connection with the other partners involved. The first part of the stakeholder integration could be realized during the first 6-10 month of the project. **(Sebastian Glende)**

(Danti) Field observations aimed at describing the floristic composition and vegetation structure characteristics will be conducted in the territory of Pompei. Four land-use types will be analysed: crops, olive groves and orchards, pasture and woodland. The assessment of the types and the intensity of land-use will be related to the available documents (maps) on land use capability and potential vegetation. This will allow to evidence the discrepancy between the current situation and a more sustainable land-use state (in terms of biodiversity conservation, soil sealing ecc.), and will help in the evaluation of the state of land conservation and management.
Health surveys will be also conducted on the main plant species to evaluate the effect of both biotic and abiotic stresses to better define the relationship between vegetation and environment and to report the presence of pathogens and pests introduced in the present age (documented in the last century). The accurate reconstruction of the landscape in the Vesuvian area will also provide essential information for comparing the past and the current environment.
Paleoenvironmental information will be obtained by means of pollen analysis, a very useful tool for reconstructing the past environmental contexts. Indeed, it provides information on the plants growing in the past, plant exploitation and, in general, the interaction between human populations and plants.
The information retrieved will be integrated into a framework aiming at modelling current species distribution over the area as well as to reconstruct the climate of the past. In particular, species distribution over the Vesuvius will be related to relevant climate conditions, topographic variables (elevation, aspect, slope, curvature) as well as soil type to derive an empiric model using a machine learning approach. This model will allow to reproduce the present distribution of vegetation over the study area as well as to outline possible changes in climate conditions in the past using an inverse modelling approach.
A very interesting but poorly studied topic is the palaeoecological observation addressed to identification of plant pathogens of the past, responsible of infectious disease to vegetation, contributing to its change. Detection of remains as fungal spores in the samples used for the palynological observations could allow to shed light on the presence of fungal parasites of plants in the past. **(Danti)**

Deliverables

(Gaetano Di Pasquale) Report about the plant landscape evolution on the study area
Diachronic land use Maps **(Gaetano Di Pasquale)**

(Sebastian Glende)

- Description of user and stakeholder groups as persona cards
- Description of requirements and needs of these stakeholder groups
- ?? Description of use cases / scenarios ??
- ?? Description of marketing / acceptance criteria for each user group to ensure a good and effective communication of the project ??

(Sebastian Glende)

(Danti) Physiognomic analysis on natural and semi-natural land cover and ecosystems, including information on land use and cultivation, derived from aerial photographs, satellite image interpretation, thematic maps and field observations.
Model describing vegetation distribution over the site
List of plants detected in archaeological layers through palynological observations and eventual fungal pathogens sampled with pollen grains, useful elements to reconstruct the history of both natural and planted woody plants. Reconstruction of changes in past climate conditions. **(Danti)**

Table 3.1a: Work package WP4 description

Work package number 4		**Start Date or Starting Event**					
Work package title	**Software development (Sebastian Glende)**						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

(Sebastian Glende) YOUSE could support the software development by realizing the whole part of user-centred-design incl. testing during the software development. This could encompass e.g.:
- definition of software user groups
- requirements analysis of these groups regarding the use of the software
- idea identification with creative techniques to find out, which functions of the software are needed and useful
- continuous testing of the developments, starting from first paper protptypes, then clickable prototypes, then pre versions of components and then the final software in the field (which means testing in reality).

This ensures a high acceptance and good usability for all user groups of the software. **(Sebastian Glende)**

(Moscati Paola)

COMPUTERS AND CULTURAL HERITAGE. THE ROLE OF INTERDISCIPLINARITY IN EXPLORING OUR COMMON EUROPEAN ROOTS

Since the mid-1950s the scientific character of all the historical disciplines was strengthened. In archaeological research, it gave rise to an intensive use of scientific techniques resulting in an interdisciplinary quantitative approach.
Major international events were organised from the 1950s onwards. Our aim is to investigate and collect documents on the earliest European Conferences dedicated to data automation in the Humanities, with particular reference to archaeology.
In this way, the common European roots of the pioneering scholars, who promoted innovative research methods within a broader movement of ideas that changed the theoretical and methodological attitude of archaeological scholarship, will be enhanced.
(Moscati Paola)

Description of work

(Sebastian Glende) The detailed description of work has to be planned in connection with the other partners involved. The part of the requirements definition could be realized during the first 6-12 months of the project. The testing and evaluation starts when first prototypes are available and ends at the end of the whole project**. (Sebastian Glende)**

(Moscati Paola)
The design of an interactive timeline seems to be the best collaborative multimedia tool to introduce the virtual presentation of international European Conferences dedicated to both data automation and the application of quantitative methods in the Humanities in general and in archaeology in particular.
In the 1950s and 1960s, the boundaries between all Humanities and Social Sciences disciplines were still blurred in their relationship with new technologies. Literature, linguistics, history, anthropology, archaeology, all proceeded together towards the new solutions offered by the application of quantitative methods and computer science. All efforts were directed to the dissemination of information for the sake of the scientific community, thanks to techniques and systems aimed at making scientific communication widely available, raising awareness of what was available, and providing prompt access to information.
In a virtual environment, an open data platform will support research works on the European historical roots of computer applications for cultural heritage. It will be directed to all public and private cultural institutions that are implementing strategies to promote and enhance knowledge through temporary exhibitions or web applications specifically designed to cultural heritage.
(Moscati Paola)

Deliverables

(Sebastian Glende)

- Description of user and stakeholder groups as persona cards
- Description of requirements and needs of these stakeholder groups
- Description of use cases / scenarios regarding the software

(Sebastian Glende)

(Moscati Paola)
- Interdisciplinary methods of data recording, management and preservation
- Electronic resources for archaeology
- Education, museums and multimedia

- Promotion of national and international scientific dissemination through electronic publishing and multimedia products
(Moscati Paola)

Code 7 (All Partners received empty templates for Work packages WP2, WP3, and WP4; please, any Partner should return these templates to each2014@gmail.com compiled as a first draft).

Table 3.1a: Work package WP5 description

Work package number five		**Start Date**					
Work package title	**Project results diffusion**						
Participants number							
Short name							
Pearson/months per Participant:							

Objectives

Objectives if this Work package are

1 - Dissemination and exploitation of results

Definition of a work plan for dissemination and exploitation of the project results; implementation of a social platform

2- Communication activities

Organization of events concerning the partners of the Consortium; preparation of a website; organization of mid term workshops and final conference open to EU Commission experts

Description of work

This Work package aim is to improve the dissemination of information about the project results and deliverables: it is a core measure of the project's success. According to this preliminary consideration, different promotion and dissemination actions are foreseen and addressed to both experts in the field and any other Stakeholders.

1 - Dissemination of project results through scientific journals and through participation in Congresses, conferences and workshops

All project results will be shared and disseminated among the project Partners. In order to ensure high visibility of the project within the scientific community, publication in high impact factor scientific journals will be encouraged, as will be presentation at relevant workshops and conferences. Each research institution in this proposal will contribute to this dissemination as participants in WP 5.

2 - Organization of a workshop and a conference

In particular, within six months from the starting of the project a workshop will be held open to specific stakeholders.

3 - Demonstration event. In close collaboration with the WP2, WP3 and WP4 teams a demonstration event will be arranged in order to show how the newly developed techniques work.

This will exhibit the validity and usefulness of the new tools to a competent audience, able to comment and discuss the results obtained.

4 - POMPEIILAB Website. Promotion of the demonstration event will be made through this website.

Other activities:

1 – Organization of the partners consortium meeting before and throughout the project activity according to the Coordinator suggestions (for 24 months); application of tools and methodologies of risk management to the governance of single parts of the project according to the suggestions of the project coordinator.

2 - Dissemination and exploitation of results deliverables, elaboration of a website concerning the activities of the project; maintenance and adjournments of the website during and after the project preparation; organization of events.

3– Project internal communication of documents and deliverables among the project partners

Deliverables

- ***Workshop and conference in and related information & dissemination material***
- ***Papers in scientific journals***
- ***Launch of fully functional Knowledge Base***
- ***Demonstration even***

- Commercial service development

-Business Plan for exploitation of products and services

Next Table 31b shows the list of work packages:

Code 8 (to be written once Work packages are ready)

TABLE 3.1b – List of Work packages

Work Package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End Month
One						
Two						
Three						
Four						
Five						
				Total months		

Next Table 3.1c shows the list of Deliverables for each Work package:

Code 9 (to be written once Work packages are ready)

TABLE 3.1c – List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date
		One				
		Two				
		Three				
		Four				
		Five				

3.2–Management structure and procedures

In order to efficiently manage the project, a specific WP dedicated to coordination and management has been foreseen in the project work plan, to ensure that suitable priority and attention will be given to project management. Within this WP 1 all the aspects related to administrative and quality management of the project will be included. The responsibility of the project coordination will be taken by XXX that will supply the Project Coordinator (PC) and a Project Officer (PO).

The project partners are fully committed and agree to work together with the utmost cooperation for the timely fulfilment of their responsibilities. Previous experiences and participations in European framework programs have led to the decision to keep this management structure as simple as possible. The **overall organizational structure** proposed for the POMPEIILAB project is presented in Figure 1. It is aimed at ensuring the fulfilment of the project objectives, by allowing clear and continuous communication among the project partners.

a) Project Coordinator

The overall management of the project will be the responsibility of XXX as coordinating partner. Key to this is the role of the Project Coordinator, which will be carried out by …….

The **Project Coordinator** (PC) will be responsible for the **overall coordination** of the **technical and scientific activities, and all other aspects of the project** including **management of potential conflicts** and compromise negotiation in the unlikely event of conflict and will also be the primary contact person for the European Commission. Hence he/she will be responsible for all communication with - and reporting to - the EC.

The **Project Officer** (PO) will be responsible for day-to-day **legal and contractual management** of the project and **administrative and financial activities.** The PO will report to the PC.

In particular, according to the Consortium Agreement, the Coordinator shall be responsible for:

- Monitoring compliance by the Parties with their obligations
- Keeping the address list of Members and other contact persons updated and available
- Collecting, reviewing and submitting information on the progress of the project and reports and other deliverables (including financial statements and related certification) to the Funding Authority
- Preparing the meetings, proposing decisions and preparing the agenda of General Assembly meetings, chairing the meetings, preparing the minutes of the meetings and monitoring the implementation of decisions taken at meetings
- Transmitting promptly documents and information connected with the project
- Administering the financial contribution of the Funding Authority and fulfilling the financial tasks
- Providing, upon request, the Parties with official copies or originals of documents which are in the sole possession of the Coordinator when such copies or originals are necessary for the Parties to present claims.

The following Table 3.2a gives a list of milestones.

Code 10 (to be written once Work packages are ready)

TABLE 3.2a – List of milestones

Milestone number	Milestone name	Related work package(s)	Estimated date	Mean of verification

The following Table 3.2b gives the critical risks identified and the possible mitigating actions.

Code 11 (to be written once Work packages are ready)

TABLE 3.2b – Critical risks for implementation

Description of risk	Work package(s) involved	Proposed risk-mitigation measures

b) The General Assembly

The General Assembly is the decision making body of the Consortium.
The General Assembly shall consist of one representative of each Party (hereinafter referred to as "Member").
Each Member shall be duly authorised to deliberate, negotiate and decide on all matters listed in the Consortium Agreement.
The Coordinator shall chair all meetings of the General Assembly, unless decided otherwise by the General Assembly.
The Parties agree to abide by all decisions of the General Assembly.
This does not prevent the Parties from submitting a dispute for resolution in accordance with the provisions of settlement of disputes.
Operational procedures for the General Assembly representation in meetings
Any Member:

- should be present or represented at any meeting;
- may appoint a substitute or a proxy to attend and vote at any meeting;
- shall participate in a cooperative manner in the meetings.

c) The Work Package leaders

All technical and scientific issues of the project, in particular relating to the interdependence between and coherence of the different WPs - will be managed and consolidated by **the Work Package leaders** who will **report to the PC directly**. To achieve the R&D objectives of the project, the experimental, scientific and technical work has been organized into 3 R&D WPs (WP2,WP3, and WP4).
For each of them, a WP leader will be appointed to take primary technical control of and responsibility for the proper management and execution of the tasks related to the particular WP. In particular, he/she establishes (in coordination with the PC) the detailed schedule of his/her WP and the work in progress. Each WP leader is also responsible for identification of risks and for proposing solutions to the PC in respect of his/her WP. Taking into account that any of these R&D WPs will be the responsibility of three/four partners, WP leaders will be rotated among partners any four months.
Each WP leader is required to provide the PC at four monthly intervals with a progress report concerning his/her WP and containing sufficient technical information to enable the PC to be assured that work is progressing according to plan.

d) Means for governance and control

The means for governance and control (quality assurance, consortium agreement and communication plan) will be tailored to the scale of the POMPEIILAB project. A correctly empowered governance and control for the overall project management will be guaranteed by following means:

The Consortium Agreement: All the POMPEIILAB rules will be included and described in detail in the **Consortium Agreement**.

This document will define:

- the responsibilities, mutual obligations and roles of the partners;
- the division of the budget;
- the strategy for the exploitation of results;
- the rules for the settlement of disputes

The Consortium Agreement will be signed within the first month of the project and will define in a very clear and detailed way: roles of each partner, formal rules of participation, voting mechanisms, criteria for evaluation of activities realized by each partner, rules for budget re-allocation, etc.

The Quality Plan: A **quality plan** will be agreed by the General Assembly at the Kick-off meeting, and will ensure that appropriate quality assurance is undertaken. It will include:

- persons responsible for quality assurance, quality standards, methodologies and procedures;
- procedures for identification, distribution, collection, filing, maintenance and disposal of quality records resources, schedule and responsibilities for conducting the quality assurance activities

Quality control will represent a key issue in the overall management of the project, since it plays a critical role in keeping the action aligned towards its final objectives.

d) Project Meetings

An initial „launch/kick-off meeting will be organized at the start of the POMPEIILAB project for all the personnel involved in the project. The purpose of the kick-off meeting is to:

- Present to all involved an overview of the project;
- Enable each participant to obtain a better perspective of his/her role in the POMPEIILAB project and set this in context with the roles and skills of other project members;
- Define the main outline of the Consortium Agreement;
- Establish procedures for Quality Assurance and formalize policies for publication, intellectual property rights and any arbitration procedures.

3.3 –Consortium as a whole

Partners of the Consortium will be all the partners working on the five Work packages. Each partner will designate a member to participate to the meetings of the Consortium.

All the rules reported in the EU suggested Consortium Agreement must be followed.

The Consortium partners belong to very different scientific disciplines, from IT engineers to archaeologists, from robotics and mechanical experts and they have to complement one another in order to create a Robotic System suitable for this project.

Analogously, the presence inside the Consortium of Enterprises is fundamental for building and experimenting the products of project.

The POMPEIILAB project is proposed by a consortium of xx **partners** from **X EU Member States** and comprises all the appropriate key players to ensure the availability of resources, capacities, technologies, capabilities, technical and operational knowledge required for the timely achievement of the goal of the project.

The consortium will bring together European efforts and methodological/technological developments and has therefore a high potential for developing and validation of innovative non-destructive diagnosis techniques to assess and monitor the state of preservation of the European heritage.

The partners to the POMPEIILAB project have the following areas of interest and activity, Table 3.3.

Code 12 Any Partner should send these data by mail to each2014@gmail.com; please only one sentence!)

Table 3.3 Areas of interest/activity for PompeiiLab project partners

(Tsakiri)
Partner:
Athens Partner (short name ATHENS)
Area of interest / activity
Three-dimensional data acquisition for the accurate documentation of the Pompeii landscape in its present state using state-of-the art geodetic technologies and creation of a three-dimensional model of the Pompeii landscape in its present state.
(Tsakiri)

(Danti) Staff: IPSP-CNR: Roberto Danti, researcher; Gianni Della Rocca, research technologist; Sara Barberini post doc; Vincenzo di Lonardo, technician.
Department of Biology, University of Florence: Marta Mariotti Lippi, Professor.
IBIMET-CNR: Marco Moriondo, researcher. (Danti)

P	Area of interest / activity

3.4 – Resources to be committed

Code 13 (Section 3.4 to be written only after all other points and sections are ready)

According to costs as stated in the budget table in Part A of the Proposal, the following Table 3.4.1 shows the costs distribution.

Table 3.4.1 Total Costs

	WP 1	WP 2	WP 3	WP 4	WP 5	Total
Personnel costs						
Other costs						
Total direct costs						
Indirect costs						
Subcontracting						
Total costs						
Requested subsidy	2					

In order to achieve the objectives of POMPEIILAB, duration of 2 months has been foreseen for the project. The overall project cost is € xxx.xxxx and **the overall EU contribution requested is € xxxx.xxx**, both reasonable and necessary considering the number of partners, the ambitious objectives and the duration of the project.
In the following, more details are provided about the costs in the main cost categories of the project.

3.4.1 - Personnel Costs

Personnel costs represent a significant part of the project budget, in total **€ xxxx.xxx**. For each work package, the personnel costs have been calculated considering the appropriate man-power (see Table 3.4 a – Summary of staff effort) needed to complete the project activities.

TABLE 3.4a – Summary of staff effort

	WPn	WPn+1	WPn+2	Total Pearson/ Months per Participant
Participant Number/Short Name				
Participant Number/Short Name				
Participant Number/Short Name				
Total Person/Months				

The weighted average monthly rate costs of the personnel that will be working in the work package are provided in Table 3.4.2

Table 3.4.2 – Weighted average monthly personnel costs in € per partner and work package

Partner	W	W	W	W	W

Next Table 3.4b shows "other direct costs" for participants where those costs exceed 15% of the personnel costs.

TABLE 3.4b – "Other direct cost" items

Participant Number/Short Name	Cost (€)	Justification
Travel		
Equipment		
Other goods and services		
Total		

3.4.2 - Travel costs (other direct costs)

The total travel costs are **€ xxxx** and refer to meeting, working session and other issues related to the coordination of participants' contributions, as well as to the attendance of conferences and events for dissemination purposes. In more detail, the following travels have been foreseen, so far, for calculating the travel costs:

Project meetings: technical and management meetings where all participants will be present, and where technical issues as well as management issues will be discussed. 6 project meetings are foreseen for the project duration (one meeting each 6 months of project).

Technical meetings: meetings needed among two or more partners collaborating on the same tasks. The twice yearly Project meetings will form a significant venue for inter WP discussions, and will make provision for specific subsets of WP managers to meet outside the main workshop on request, e.g. for inter- and intra-WP decision-making purposes.

***Dissemination meetings*:** participation to international conferences/workshops to present the POMPEIILAB results, and for attendance to the POMPEIILAB workshop. Each participant involved in WP5, will receive travel costs.

3.4.3 - Consumables (other direct costs)

The total costs for consumables amount to **€ xxxxx**.

The consumables with POMPEIILAB are mostly related to preparation, analysis, characterisation, validation, process optimisation, pre-prototype development and tests and are summarized in table 3.4.3

Table 3.4.3.a – Consumables per work package

	Consumables description

A total of **€ xxx** has been included for the purchase of durable equipment by the project partners. The equipment costs were calculated on depreciation basis, considering the duration of usage of the equipment within the project. The table 3.4.3.b provides an overview of the planned equipment purchases

Table 3.4.3.b – Equipment purchase per participant

rtner short name	Valu	Elig	Description	WP

3.4.4 - Other costs (other direct costs)

The other remaining costs amount to **€ xxxx**. These are listed in Table 3.4.4

Table 3.4.4 – Other direct costs per Work package

	Other costs

4 – Members of the Consortium

Code 14 (All Partners, starting from now, should write at least about three pages plus the relevant publications lists, concerning both the Organizations they belong to and the persons who will carry out the proposed activities)

4.1 – Participants

- A description of the legal entity and its main tasks, with an explanation of how its profile matches the tasks in the proposal;

(Allevato Emilia)

The Agricultural Science Museum (MUSA) belongs to the Naples University Federico II; this Museum was established in 2011 thanks to such extensive work of studying, tidying up, and cataloguing of several collections stored in the warehouses of the Faculty of Agriculture that was formerly, since 1873, "Scuola Superiore" of Agriculture. Thanks to extensive work of studying, tidying up, and cataloguing, these objects and collections have risen to valuable testimony to the vitality of scientific scholars of botanical, entomological, mineralogical and also technology that reflect the history of agriculture and land use of southern Italy. The main reference area is the Gulf of Naples and the territory surrounding the active volcano Vesuvius (Fig. 1), which is well know for its eruption in 79 AD.

Several landscape studies (e.g. plant landscape, cultural landscape) have been carried out by a strong multidisciplinary research group with botanists, agronomist, forestry scientis and archaeologists.

The Vegetation history and wood anatomy lab (www.charcoalab.unina.it), belonging to MUSA, has been working since 15 years on archaeobotanical materials coming from Italy and abroad. Several researches concerning the Roman plant ladscape and its interaction with man have been carried out in Vesuvius area and in Campania region (e.g. The Poppea's villa at Oplontis, Herculaneum, The garum factory at Pompeii, the so called Augustus' villa in the northern side of Vesuvius, the Neapolis harbour).

(Allevato Emilia)

(Moscati Paola)

CNR – ISMA

INSTITUTE FOR ANCIENT MEDITERRANEAN STUDIES

(http://www.isma.cnr.it/)

The Istituto di Studi sul Mediterraneo Antico (ISMA) was established in 2013 following the merger of the Istituto di Studi sulle Civiltà Italiche e del Mediterraneo Antico (ISCIMA) and the Istituto di Studi sulle Civiltà dell'Egeo e del Vicino Oriente (ICEVO). The Institute undertakes historical, archaeological and philological-epigraphic research following an interdisciplinary perspective. The main areas of investigation are in the Ancient Near East, Aegean, North Africa, and Italy in a period of time ranging from the 4th millennium BC to the Roman imperial times. The traditional methods of archaeological and historical research are supported by computer applications and archaeometric studies. Databases, GIS platforms and other innovative research instruments are aimed at reaching advanced results for the reading and interpretation of material data, literary and epigraphic sources. The Institute has close collaboration with local authorities, museums and other national and international research and academic institutions.

(Moscati Paola)

- a curriculum vitae or description of the profile of the persons, including their gender, who will be primarily responsible for carrying out the proposed research and/or innovation activities;

(Allevato Emilia)

Gaetano Di Pasquale (Responsible)

Italian citizen, male, Born in Naples (I) 16.03.1960.

Researcher of Applied Botany at University Federico II - Napoli. Lecturer of Wood Technology and at University Federico II - Napoli.

Between 1993 and 2005 Lecturer of Bioarchaeology and of Environmental Archaeology at Siena University.

Member of Italian Botanical Society.

Member of the CNR - INNOVA Regional Centre of Competence for Development and Transfer of Innovation for Cultural and Environmental Heritage.

Scientific supervisor of the Task "Landscape level - Pedoanthracological analysis" of the European project "Modelling Dynamics in Mediterranean Ecosystems" (Program Environment DGXII), and scientific supervisor of palaeoenvironmental issues at Sintra-Cascais and Mafra Natural parks (Portugal).

Scientific supervisor of archaeobotanical task of the projects "Archaeology of Medieval landscapes" and "Great Uffizi" at Dep. of Archaeology and History of the Arts at Siena University Scientific supervisor of the archaeobotanical task in the multidisciplinary project of Tokyo University "Restoration of cultural and natural environment of the area covered by volcanic eruptions", at Somma Vesuviana (Naples).

Scientific supervisor of an agreement of joint supervision of PhD Thesis with the "Ecole Pratique des Hautes Etudes" Université Paris-Sorbonne (France).

The main research objectives concern the historical and successional vegetation processes in Mediterranean and tropical environment with different time and space scales. These studies are aimed to assess the effect of the climate and of anthropic impact on the vegetation cover during recent Holocene; recently he also carried out studies about feeding and agricultural production in Italy between Roman time and Middle Age. The research is based on charcoals, pollens and macroremains analysis. He has active collaboration with different countries both in the Mediterranean area and in South America.

(Allevato Emilia)

(Moscati Paola)

Dr. Paola Moscati - CNR – ISMA - paola.moscati@isma.cnr.it

PAOLA MOSCATI (Rome, 02.06.1960) is Research Director at the Italian CNR-ISMA and Editor of the international open access Journal «Archeologia e Calcolatori». She has conducted archaeological surveys and excavations in Etruria and in the Faliscan territory, with particular reference to the ancient towns of Caere and Falerii Veteres. Scientific director of the research project “Archaeology and Information Society. Computer methodologies and formal methods to improve archaeological knowledge”, between 2010 and 2013 she has been seconded to the Accademia Nazionale dei Lincei as scientific coordinator of the research project on “The history of archaeological computing”. Scientific director of the “Caere Project” within the CNR Cultural Heritage Special Project and other projects funded by MIUR and aimed at the dissemination of scientific culture. Authorised Contact Person of the CNR-ISCIMA in the European Project EPOCH. Contract Professor at the Universities of Napoli Federico II, Roma La Sapienza and Tor Vergata, Tuscia-Viterbo (Informatics applied to cultural heritage and archaeology) and tutor of educational stage activities. Author of many scientific publications, among which the pioneering book Archeologia e calcolatori, Firenze 1987. As Editor of «Archeologia e Calcolatori», she organized the III International Symposium on Computing and Archaeology in 1995 and the Conference on the Birth of Archaeological Computing at the Accademia Nazionale dei Lincei in 2008. She also edited international Conference Proceedings and Special Thematic Issues.

(Moscati Paola)

- a list of up to 5 relevant publications, and/or products, services (including widely-used datasets or software), or other achievements relevant to the call content;

(Allevato Emilia)

Di Pasquale, G., Allevato, E., Cocchiararo, A., Moser, D., Pacciarelli, M., & Saracino, A., 2014. Late Holocene persistence of Abies alba in low-mid altitude deciduous forests of central and southern Italy: new perspectives from charcoal data. Journal of Vegetation Science, 25, 1299-1310.

Moser D., Allevato E., Clarke J.R, Di Pasquale G., Nelle O., 2013. Archaeobotany at Oplontis: the last available woody remains from the Roman Villa of Poppaea (Naples, Italy). Journal of Archaeological Science, 22, 397-408

Allevato E., Buonincontri M.P., Vairo M., Pecci A., Cau M.A., Yoneda M., De Simone G.F., Aoyagi M., Angelelli C., Matsuyama S., Takeuchi K., Di Pasquale G., 2012. Persistence of the cultural landscape in Campania (Southern Italy) before the AD 472 Vesuvius eruption: archaeoenvironmental data. Journal of Archaeological Science 39, 399-406

Allevato E., Russo Ermolli E., Boetto G., Di Pasquale G., 2010. Pollen-wood analysis at the Neapolis harbour site (1st -3rd century AD, southern Italy) and its archaeobotanical implications, Journal of Archaeological Science 37, 2365- 2375. [5-Year Impact Factor 1.966]

Di Pasquale G., Allevato E., Russo Ermolli E., Lubritto C., Yoneda M., Takeuchi K., Kano Y., De Simone F., 2010 Reworking the idea of chestnut (Castanea sativa Mill.) cultivation in Roman times: new data from ancient Campania. Plant Biosystem 144, 896-904

(Allevato Emilia)
(Moscati Paola)

- Moscati P., Parcours culturels pour une histoire de l'informatique appliquée à l'archéologie, in L. Costa, F. Djindjian, F. Giligny (dir.), Actes des 3èmes Journéesd'Informatique et Archéologie de Paris - JIAP 2012 (Paris 2012), «Archeologia e Calcolatori», Suppl. 5, 2014, pp. 9-17.

- Moscati P., Jean-Claude Gardin (Parigi 1925-2013). Dalla meccanografica all'informatica archeologica, «Archeologia e Calcolatori», 24, 2013, pp. 7-24.

- Moscati P., Archaeology and computers: perspectives of the 21st century, in M. Brunori, L. Godart, E. La Rocca, P. Sommella (eds.), Mediterranean Archaeology: A GID-EMAN Training Course (Rome, October 2012), Atti dei Convegni Lincei 275, Roma 2013, pp. 91-108.

- Caravale A., Piergrossi A., Archeologia in rete. Le riviste open access: risorse e prospettive, «Archeologia e Calcolatori», 23, 2012, pp. 187-207.

- Moscati P. (ed.), Virtual Museums and Archaeology. The Contribution of the Italian National Research Council, Supplemento di Archeologia e Calcolatori, 1, 2007.

(Moscati Paola)

- a list of up to 5 relevant previous projects or activities, connected to the subject of this proposal;

(Allevato Emilia)

2013→
Excavation and conservation project of a monoxyle wood pirogue from the Bronze/Iron Age settlement of Poggiomarino – wood and biological analysis.
Coordination by Soprintendenza Speciale Beni Archeologici Pompei Ercolano Stabia.
Funding by MUSA- Agricultural Science Museum.

2010→
The Oplontis Project - analysis of the charred wood in the so-called Roman Poppea's villa at Torre Annunziata.
Coordination and funding by The University of Texas at Austin (USA).

Herculaneum Conservation Project – analysis of the charred wood in Herculaneum.
Coordination by the British School at Rome.
Funding by the Packard Humanities Institute (USA).

2004-2009
Restoration of cultural and natural environment of the area covered by volcanic eruptions Project – analysis of the charred wood and plant remains from the so-called Roman Augustus villa at Somma Vesuviana.
Coordination and funding by The University of Tokyo, Japan.

2004-05
Archaeobotanical analysis at the Neapolis harbour site – analysis of the wood of three Roman shipwrecks and study of the plant remains recovered on the palaeo-seafloors.
Coordination by Soprintendenza per i Beni Archeologici di Napoli.
Funding by MetroNapoli SpA.

(Allevato Emilia)

(Moscati Paola)

- The electronic repository of the scholarly open access Journal «Archeologia e Calcolatori»
- (http://www.progettocaere.rm.cnr.it/databasegestione/google_year_list.htm)

- The Virtual Museum of Archaeological Computing
- (http://archaeologicalcomputing.lincei.it/)

- The Bibliography of Archaeological Computing
- (http://archaeologicalcomputing.lincei.it/index.php?en/93/moscati-1990s)

(Moscati Paola)

- a description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work;

(Allevato Emilia)

- Τηε Λαβ ισ φυλλψ εθυιππεδ for any kind of facility for archaeobotanical analisys:
- Epilluminated microscopes with high-power magnification (10X- 1000X) for the observation of charcoal remains
- Stereo microscopes at low-power magnification for the observation of macroremains
- Transmitted light micrscopes (10X- 1000X magnification) for the study of wood thin sections
- Dendrochronographer
- Refrence collections for charcoal analysis and carporemains
- cryostat freezing microtome

(Allevato Emilia)

- any other supporting documents specified in the work programme for this call.

(Tsakiri) The Athens Partner (short name ATHENS) of the PompeiiLab Consortium comprises researchers from two academic institutions, the National Technical University of Athens (NTUA), School of Rural and Surveying Engineering and the Technological Institute of Athens (TEI), Department of Surveying and Geoinformatics Engineering. The leader of the Athens Partner is Dr Maria Tsakiri from NTUA.

The National Technical University of Athens (NTUA) with about 15,000 students enrolled in 10 different engineering programs of study is the most prestigious and oldest technical university in Greece. Owing to its internationally recognised achievements in both teaching and research, NTUA exerts a strong attraction on students from Greece and a small number from overseas. The university's research activities in the fields of engineering are distinguished by their international orientation, as well as by the interdisciplinary and collaborative character of work carried out by over 600 academic staff at the university. The School of Surveying Engineering is one of the most well organised and active Schools of NTUA and performs high-rated research on various topics of geomatics such as geodesy, photogrammetry, remote sensing and spatial information sciences.

The Technological Educational Institute (T.E.I.) of Athens is a higher-educational institute and the third largest Institution of Higher Education in Greece, with approximately 35,000 students and a regular faculty of 600 academics. TEI of Athens offers undergraduate and postgraduate studies. The Department of Civil Engineering and Surveying & Geoinformatics Engineering offers high-level scientific and technological education, and aims at advancing the development and dissemination of knowledge in the wider scientific and technological field of Surveying and Geoinformatics, based on both theoretical and practical teaching as well as applied and technological research.Emphasis is given is the areas of spatial data acquisition, measurement and analysis of spatial data, specialized geomatics knowledge and expertise in producing and handling land informationfor a number of activities such as land survey, geodetic, photogrammetric and cartographic projects, building and maintenance of Geographical Information Systems for town and regional planning as well as environmental projects, etc

The leader of this partner group, Dr M. Tsakiri is an Associate Professor and tenured staff member of the School and belongs to the Laboratory of General Geodesy which is involved in high calibre research. The Laboratory has many PhD students and other research and technical staff. The principal areas of research where the Laboratory is involved include: high precision positioning and navigation, metrological issues of geodetic equipment, terrestrial laser scanning basic and applied research, cultural heritage recording, documentation and 3D modelling, structural monitoring, etc. The infrastructure currently available at the Laboratory includes top of the range electronic total stations and other geodetic instruments, GNSS (Global Navigation Satellite Systems) receivers, a terrestrial laser scanner, a ground-based Synthetic Aperture Radar (GBSAR) which is a powerful terrestrial radar-based technique to measure and monitor surface deformation, digital cameras, camcorders, a range camera, a metrology facility and a variety of proprietary software. The above infrastructure will be available for the execution of the project.

The Laboratory provides technical support, consulting and training to industry, government bodies and various other professional groups in Greece and overseas concerning cultural heritage recording applications. They also maintain close collaboration with prestigious European Research Institutions and Universities, such as ETH (Switzerland), University College London (UK), University of Nottingham (UK), Curtin University of Technology (Australia), University of Sydney (Australia), Vienna Technical University (Austria), and many others.
The Athens group comprises the following members:

1) Dr Maria Tsakiri, Associate Professor, NTUA(leader of the group)
2) Dr Eleftherios Tournas, senior researcher, NTUA
3) Mr Antonios Sioulis, research associate, NTUA
4) Dr Vassilios Pagounis, Associate Professor, T.E.I.
5) 2 PhD students (Tsakiri)

(Tsakiri) **Brief CVs of the key personnel**

1) Maria Tsakiri

Dr. Tsakiri received her diploma in Surveying Engineering from the National Technical University of Athens (NTUA) in 1992, and her Ph.D. in Satellite Geodesy from the University of Nottingham in UK in 1995. She held academic positions at Curtin University of Technology in Australia from 1996 to 2000 and from 2000 up to date she is within the School of Rural and Surveying Engineering of NTUA Her primary research focus is on the use of optical and range imagery for automated 3D object reconstruction. Her specific interests are in sensor modelling and calibration, 3D data registration and feature extraction from point cloud data spanning a variety of sensors including terrestrial laser scanners and 3D range cameras. Her recent research has focused on a diverse range of applications including structural deformation measurement, metrology, cultural heritage and industrial recording. She has published over 90 papers in international refereed journals, and international conference proceedings and supervises three new PhD candidates on the area of geomatics and other two have already granted their degree.
She has been involved in many research projects financed by Greek Government Bodies or international funds and have been active in securing and managing a number of competitive grants. Themes of recent projects related to this proposal, are:

- Geometric documentation of major Archaeological sites (e.g. Ancient Messini), ancient theatres (e.g. theatre of Thiva) and monuments of cultural significance, such as castles (e.g. castle in the island of Rhodes), Byzantine churches, major and complex Statues (e.g. Hermes of Praxiteles in Ancient Olympia), speleological caves (e.g. caves in Kalymnos);
- Development of algorithms and data fusion in 3D reconstruction and modelling of cultural monuments (e.g. the Statue of Hermes, industrial constructions, culturally significant ships, caves etc;
- Design and development of Spatial Information Systems, for archaeological applications, e.g. inventory of byzantine churches in Greece

Five selected Publications relevant to the project:

1. Tournas L, M Tsakiri (2007) Orthophoto generation from unorganized point clouds. *Journal of Photogrammetric Engineering and Remote Sensing,* Vol 73, No 11, November.
2. M Tsakiri, V. Pagounis, O. Arabatzi (2015) Evaluation of a pulsed terrestrial laser scanner based on ISO standards. *Journal Surf. Topogr.: Metrol. Prop.* (3)015006. doi:10.1088/2051-672X/3/1/015006
3. Tournas E, M Tsakiri, I Efessiou (2010) The use of terrestrial laser scanning in the renovation of historic buildings. In: *Proc. the 8th Intern. Symposium on the Conservation of Monuments in the Mediterranean Basin MONUBASIN*, May 31- June 2, Patra, Greeece [on CD-ROM].
4. Tournas E, M Tsakiri (2009) Automatic 3D point cloud registration for cultural heritage documentation. In: *Proc. of ISPRS Workshop Laserscanning 2009*, September 1-2, Paris, France [on CD-ROM].
5. Gianniou P, A Georgopoulos, M Tsakiri, K Della (2007) The documentation of the medieval entrance of the Rhodes fortification complex. In: *Proc. of the XXIth CIPA Int. Symposium "Anticipating the future of the cultural past"*, 1-10 October, Athens, Greece.

Five selected projects relevant to the project:

1) *Terrestrial laser scanning for geodetic monitoring applications* (2003-2005), funded by NTUA, Research Program Thalis (project leader).
2) *Application of advanced geomatic techniques to heritage recording the Greek antiquities* (2003-2005), in collaboration with Curtin University of Technology, Australia and funded by the Australian Research Council

(project leader of the Greek team).

3) *Seismic base isolation for the statue of Hermes of Praxiteles at the New Museum of Ancient Olympia* (2002-2003), funded by the Greek Ministry of Culture (project leader of the surveying team).

4) *Automatic registration of laser scanner point clouds* (2006-2008), funded by NTUA, Research Program Pithagoras (project leader).

5) *Calibration and measuring utilization of range camera devices* (2008-2011) funded by NTUA, Research Program PEBE08 (project leader)

2) Eleftherios Tournas

Dr. Tournas received his diploma in Surveying Engineering from the National Technical University of Athens (NTUA) in 1992, and his Ph.D. in Phogrammetry from the same university in 2003. He held research positions at NTUA up to date and has participated in many research projects and also assists in undergraduate classes. His primary research focus is on the use of optical and range imagery for automated 3D object reconstruction and dense image matching, GIS software development and geoinformatics projects His specific interests are in 3D modelling from point cloud data from images, aerial laser scanners, terrestrial laser scanners, 3D range cameras, virtual reality projects. He has involved on a diverse range of applications including cultural heritage, structural deformation measurement, etc. he has over 30 publications in international journals and conference proceedings.

Five selected Publications relevant to the project:

1. Tournas L (2014) Hierarchical semi-global matching algorithm. *Proc. 4th Symposium of Hellenic Technical Chamber of Engineers, 26-28 Sept., Thessalonica, Greece*.
2. Tournas L, M Tsakiri (2007) Orthophoto generation from unorganized point clouds. *Journal of Photogrammetric Engineering and Remote Sensing,* Vol 73, No 11, November.
3. Tournas E, Tsakiri M 2008. "Deformation monitoring based on terrestrial laser scanner point cloud registration". Proc. 13th FIG Symposium on Deformation Measurement and Analysis & 4th IAG Symposium on Geodesy for Geotechnical and Structural Engineering», 12-15 May, Lisbon, Portugal [on CD-ROM].
4. Tournas E, M Tsakiri, I Efessiou (2010) The use of terrestrial laser scanning in the renovation of historic buildings. In: *Proc. the 8th Intern. Symposium on the Conservation of Monuments in the Mediterranean Basin MONUBASIN*, May 31- June 2, Patra, Greeece [on CD-ROM].
5. Tournas E, M Tsakiri (2009) Automatic 3D point cloud registration for cultural heritage documentation. In: *Proc. of ISPRS Workshop Laserscanning 2009*, September 1-2, Paris, France [on CD-ROM].

Five selected projects relevant to the project:

1) *Measurement of deformations in concrete structures with FRP reinforcement using modern surveying techniques with digital photogrammetric methods and 3D Laser Scanning* (2004-2008), funded by Greek Secretariat of Research and Development (GSRT) and EC (senior researcher in the team).

2) *Automatic registration of laser scanner point clouds* (2006-2008), funded by NTUA, Research Program Pithagoras (senior researcher).

3) *Geometric documentation with modern photogrammetric methods of Neolithic settlement on the hill Zagani, Spata* (1998) funded by the Greek Ministry of Culture (researcher involved in the software development to application techniques of digital photogrammetry in mapping archaeological sites).

4) 3Documentation for the restoration of the neoclassical building Villa Rosa in Corfu (2007-2009) funded by the Greek Ministry of Culture (researcher in the team).

5) 3D Documentation of the Catholic of the byzantine Monastery of Saint Luke in Boeotia, Greece (2007-2009), funded by the Greek Ministry of Culture (researcher in the team).

3) Vassilios Pagounis

Dr. Pagounis received his diploma in Rural and Surveying Engineering from the Aristotle University of Thessalonica in1992 and his PhD in Geodesy in 2000 from NTUA. He is currently an Associate professor in Technological Educational Institute (T.E.I.) of Athens, Department of Civil Engineering and Surveying & Geoinformatics Engineering. His specific interests are in 3D modelling from terrestrial laser scanners, terrestrial laser scanner metrology, high precision surveying etc. He has involved on a diverse range of applications including cultural heritage documentation, structural deformation measurement, and has over 50 publications in international journals and conference proceedings. He has participated in many research proposals either as a leader or partner member financed by Greek

bodies and related to the geometric documentation of monuments, generation of 3D models and high precision photorealistic models combining techniques of photogrammetry, image processing and laser scanning, monitoring and documentation of monuments and complexes with geodetic methods.

Five selected Publications relevant to the project:

1) V. Pagounis, V. D. Andritsanos, A. Papathanasiou, L. Tournas, M.Tsakiri (2013) The use of terrestrial laser scanning in the development of models for a heritage building information system. Proc. of Geomat 2013, IASI 14-16 November, Romania.
2) Arabatzi, O., V. Pagounis, M. Tsakiri (2011) Experiences in cultural heritage documentation using modern geodetic techniques - Monuments at the Acropolis of Athens. In: *Proc. FIG Working Week,* 18-22 May, Morocco.
3) Pagounis V, O Arabatzi, M Tsakiri, D Tsini (2010) Geodetic technology for cultural heritage monitoring - the case study of Clepsydra at the Acropolis of Athens. In: *Proc. the 8th Intern. Symposium on the Conservation of Monuments in the Mediterranean Basin MONUBASIN*, May 31- June 2, Patra, Greeece.
4) Pagounis V, M Tsakiri, S Palaskas, B Biza, E Zaloumi (2006) 3D laser scanning for road safety and accident reconstruction. In: *Proc. of the XXIII FIG Congress "Shaping the Change"*, 8-13 October, Munich, Germany.
5) Hristodoulou, O., V. Pagounis and M Tsakiri (2015) 3D modelling for the digital documentation of a maritime heritage boat. Proc. GeoPrevi Symposium, 8-9 May, Bucharest, Romania.

Five selected projects relevant to the project:

1) *Application of Modern Techniques for Documentation of Prehistoric Geometric Building the Temple of Apollo in Thermo* (2005), funded by Greek Ministry of Culture (Dept. of 6th Prehistroric and Classical Antiquities) (project leader).

2) *Development of Algorithms for the automatic generation of precision photorealistic models combining techniques of Photogrammetry, Image Processing and Laser Scanning-Implementation Issues in Cultural Heritage* (2005-2007) funded by the Greek Secretariat of Research and Development (GSRT) and EC, program Archimedes II (member of the research team).

3) *Geometric continuous monitoring and documentation of monuments and complexes with a combined Geodetic methods* (2007), funded by the Greek Ministry of Culture (dept. 1st Prehistoric and Classical Antiquities) (project leader).

4) *Creation of 3D models for the geometric documentation of monuments with combined application of geodetic methods* (2008), funded by the Greek Ministry of Culture (dept. 1st Prehistoric and Classical Antiquities) (project leader).

5) Modern 3D techniques in as-built projects (2010) funded by the Greek Secretariat of Research and Development (GSRT), programs with industry ((project leader).

4) Antonios Sioulis

Mr. Sioulis received his diploma in Rural and Surveying Engineering from NTUA in1993 and he is currently a research associate at the School of Rural and Surveying Engineering in NTUA. His specific interests are in high precision surveying, geometric documentation from different platforms such as UAV, and using techniques such as navigation type GNSS receievers. He has experience in surveying documentation and structural deformation measurement applications.

Selected Publications relevant to the project:

1) Sioulis, A, M Tsakiri, G Piniotis, A Bimis, D Stathas (2015) Evaluation of low cost GNSS receivers based on ISO RTK standards. Proc. FIG Working Week, 17-21 May, Sofia, Bulgaria.
2) Stathas D., Sioulis A., Piniotis G., Bimis A. (2014) Topographic map referencing in the Greek National Reference System using low-cost GNSS receivers and smartphone or tablet. Proc. 4th Panhellenic Congress of Rural and Surveying Engineers, Sep. 26-27, Thessaloniki, Greece

Selected projects relevant to the project:

1) *High accuracy geometric documentation of the Greek Navy submarines* (1997-2000), funded by the Greek Ministry of Defense (member of the research team)
2) *Geometric documentation of the landscape and collapsed buildings from the Athens earthquake on Sept. 1999* (1999-2001) funded by the Greek Ministry of Environment (member of the research team).

3) Boundary definition and surveying mapping using GNSS systems for the property of the Church of Greece, in the region of Attica Schistou (2002-2003), funded by the Church of Greece (member of the research team). (Tsakiri)

4.2 – Third parties involved in the Project

No third parties involved in this project

5 – Ethics and Security

5.1 – Ethics

There is no ethics issue in the ethical issue table in the Administrative Proposal Form of POMPEIILAB, Part A.

5.2 – Security

The activities or results of this project do not raise security issues.