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**Proposal for Horizon 2020**

**CALL: H2020-INFRASUPP-4-2015**

**PART B: Section 1-3**



**Title:“PERITIA - The Establishment of a New Profession for e-Infrastructure Professionals”**

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6. **Excellence**

The fields of research and digital data have become more and more complex with demands for the use of very large data sets on massive e-infrastructure processing technologies, and require sophisticated analytical methodologies to process the experiments and results. It requires not only competitive researchers, but also highly skilled and well trained technical staff specialising in data science and its highly complicated e-infrastructure comprising of networks, data repositories, computers, software and skills. Although the contribution of these highly skilled and well trained technical staff is essential for the application of data science and big data technologies, there is not yet a well defined career development path to recognise their essential role in this increasing important field. This proposal seeks to establish a new and distinct profession for e-infrastructure professionals to give them the recognition and esteem they deserve.

The European Union has been addressing these issues with the establishment of the e-Competence Framework group. This is because in general the lack of standardisation and conformity in education and certification processes makes it difficult for employers to recruit the right staff. The European e-Competence Framework (e-CF) is a reference framework of ICT competences that can be used and understood by ICT industry, see www.ecompetences.eu, 2014. The Framework defines 23 ICT professional profiles with core competencies and corresponding educational qualifications. It also highlights a picture that reveals a professional body could act as a central arena for generating solutions to these critical issues and for providing a forum for dialog for business and education sectors. A Professional Body representation would prove its worth by encouraging all public and private stakeholders to take action in attracting young people into e-infrastructure, and by providing life-long learning opportunities for those already in the industry.

The establishment of a new career path will also assist to address a critical new problem arising, that is one of a severe skills shortage, as the number of e-infrastructure sites increase and the availability of trained personnel is not matched with the development of demand for Big Data and High-performance computing technologies. There is a significant mismatch between the skills on offer and those in demand in today's fast developing technology market. If this issue is not resolved, it is estimated that Europe might face a shortage of up to 900,000 ICT professionals by 2020. If this problem is not addressed then Europe will not remain competitive in the global market risking its potential for growth and digital competitiveness.

**1.1 Objectives**

The overall objective is the establishment of distinct professions for e-infrastructure professionals who currently work as support workers to research projects and librarian projects in universities and high performance labs. We wish to also include in our definition the e-infrastructure staffs who work in industry in similar jobs specifications, in order to create a fully comprehensive career structure for people with e-infrastructure skills and qualifications. Our proposal relates to part (3), (4) and (5) only of the work programme topic, that is the definition of a career structure and recognition of work for staff on research projects, and communication of the topic out to the community.

Our proposal seeks to tackle a very important issue of staff shortages and training, and by providing greater recognition we will help to attract more personnel into the field. Without this our industries and research capabilities will be limited in the future, if demand for skilled e-infrastructure staff reaches a predicted severe shortfall while the needs for staff to work on analysing and storing ‘Big Data’ projects, and using new technologies such as HPC.

* **Establishment of a Professional body of ‘e-infrastructure scientists’** similar to other professional bodies. Since currently the only recognition is from certificates given from companies such as Cloudera, we will recommend a clear definition of appropriate independent professional bodies of national and international standing that can certify members according to a reference model of skills and training programs, as defined next.

We will explore how professional bodies are established for similar professions and how independent professional representation organisations could be formulated, nationally and internationally to define the new e-infrastructure career. By establishing formal representation of the e-infrastructure profession, university courses and certification of other courses could provide greater recognition for the e-infrastructure professional.

* **‘ecosystem of knowledge’** - The objective is to request inputs and work together in seminars and workshops within the project activities to gather knowledge from as many e-Infrastructure sites and groups and associates as possible. The ‘ecosystem of knowledge’ will draw together representations from all the different groups of e-infrastructure laboratories and HPC centres and research staff, industry personnel working with Big Data. In this way all the key stakeholders can be brought together in discussions to find the best solutions to building this new profession. We will also review the current popular websites and conferences for e-infrastructure personnel for similar input to stay current with trends in the marketplace.
* **Education**: Review of the strategic planning for national and EU e-Infrastructure development [[1]](#footnote-1)stresses the need for qualified staff to be made available in order for the research to be possible. The modern techniques for science and technological research use very advanced data generation and analysis and computational methods. The next generation of research e-Infrastructure therefore needs not only to facilitate large scale Data Analytics and Modelling but also allow secure collaborative working over both public and proprietary data sets, using HPC and Cloud computing with knowledge of how to keep data secure. Without highly skilled e-infrastructure technical staff none of this is possible. Education of e-Infrastructure staff is a crucial module of PERITIA when considering the global shortage of personnel in this field that is predicted to happen in the next decade. We will review educational networks such as JANET (in UK), HEANET (Ireland) and GEANT for PAN European education and research networks for e-Infrastructure. There is also the life-long learning pathways to consider from secondary school level teaching of new fields of Statistical Mathematics to school children, onwards to e-skills for ‘up-skilling’ on the job later in life.
* **A Competency Framework and Reference Model to define the career of e-infrastructure Professional**: Made up of ‘case studies’ and skills for each level of career definition, see figure 1.
* Each Competency Framework case study shows an area of e-Infrastructure skills and the Reference Model corresponds to clarify the exact nature of the levels of competence required with examples of ‘best practices’ for each case study.
* A software profiling tool, assisting the user to define the roles for use by HR resources.
* The models are to be used to provide the *certification* to gain the professional recognition from the national and international representative body, we will have defined as the test Professional Association website.
* **Definition of career paths for e-Infrastructure Professionals**: Data Scientist, Data Analyst, HPC Programmers, Database Administrators, Statistical Analyst, Digital Archivist, System Administrator, etc. There are currently several types of personnel working on e-Infrastructure, as listed, we wish to create a new profession that can include all these disciplines and give them the recognition they deserve.
* **Awareness raising activities– by defining a high-profile website** for the professional body, with a repository of white paper publications, high profile industry reports, tutorials and guides for career paths. With the use of social media instruments and links to major popular sites, to have a centralised and responsive centre for professionals with updates for continuous learning courses, details of all recognised university courses, on-going accreditation awards, guides for achieving accreditation, etc.

* **Societal challenges and issues of Social Inclusion**

The project will review and address social inclusion issues for the e-Infrastructure profession. For example, it will examine ways in which the professional body could tackle the considerable imbalance in female employees currently facing the industry, and could promote gender equality and recruitment programs from universities and schools to address the issue. Other inequality issues will also be surveyed (e.g., underrepresentation of people with disabilities) and we will have solutions proposed in our designated reports.

**1.2 Relation to Work Program**

Our proposal relates to part (3), (4) and (5) only of the work programme topic, that is the parts to do with the professional recognition and career definition of the e-infrastructure professionals. Our proposal is focused on creating a new distinct profession, and professional bodies to represent the e-Infrastructure engineer and scientist, and communicating the new definition of the career to the next generation of potential participants to a bright future of promising rewards. There is a predicted forecast of a great lack of these staff in the future as Big Data projects arise with great frequency, as more and more research projects require digital content data analysis and storage handling. We will also look at what is happening at the corresponding jobs in industry, to more fully address the topic of e-Infrastructure careers in general.

For career advancement, an academic researcher in universities, depending on the performance in terms of research publications, funding and other academic indicators, he/she can progress in his/her career step by step, such as Lecturer, Senior Lecturer, Reader and Professor. A similar reference model will be established here for e-Infrastructure professionals. The corresponding relevant work experience and degree of competence achieved according to best practices and years of experience could be recognised in a similar way like academic researcher’s career path, and would also help to design certification programs for various gradations of staff levels. First we document the ‘State-of-the-Art’ technologies and programming used by e-Infrastructure professionals, and then we create the Reference Model with best practice prototypes examples for use by the Professional standards bodies to establish certification programs – see each Work Package description for further details, for each sub-specialty and grade of the profession.

To operate modern e-Infrastructure in data science related activities, highly developed competence, knowledge and skills are essential. Such assisting roles may not directly bring new findings but they are essential for any scientific research in data science. It is not appropriate to measure these contributions in terms of scientific publications or research funding only. Therefore, we will develop alternative means for recognising non-research contributions by research technologists and data scientists. - ***We instead chose the ICT CEN Competencies Framework approach:***

* Develop a Framework for Competencies with the State-of-the-Art of e-Infrastructure
* Add a Reference Model of case studies of ‘best practices’
* Develop a profiling software tool of complexity measurement for e-Infrastructure career definition for use by HR resources similar to that available with CEN CWA
* Place all of the above in a certification process – available at an official Professional Association website established to represent the new profession

The important purpose of our project will be to continue the European ICT Profile Family –CWA vision and rationale:

“*The prime objective of this CEN Workshop Agreement (CWA) is to increase transparency and to continue the convergence of the European ICT Skills landscape by providing a set of European ICT Professional Profiles.*”

An obvious choice for improving the profile of a profession would be to establish a body to have recognition by a national and international Professional Association – and then ***certification*** according to qualifications and skills and experience to be reflected by human resources in pay scales systems.

* Develop a human resource management system that is responsive to career development needs and provides promotions and adequate pay scales.

**What is the Reference Model Anyway?**

The Reference Model is a set of demonstrations for the e-Infrastructure technologies of case studies or ‘best practices’ that determine the level of technical competencies that are required by the Competency Framework – roles at levels, for e-Infrastructure this is very important to determine the relevant grades.

For example – in the specification below, *the skills are in red, so ‘best practices’* for the role would be examples of these :

***Example JOB SPECIFICATION*: Company ‘Name Global’ is looking to recruit a Data Scientist for a London based client. The role will require experience with the following skills:**

* **Data analysis using specialized statistical computer programs, and presenting research results in numerical and graphic formats.**
* **Developing statistical surveys by designing data collection instruments, calculating sample   
  sizes and selecting appropriate analytical procedures.**
* **Conducting data analysis and producing reports**
* **Summarizing statistical results of a research project by creating graphs, tables and charts.**
* **Cleansing data using SQL.**

**Competency Framework - A Case Study**

|  |
| --- |
| 1. **Name** (alternative names) –Software Architect, Data Analyst |
| 1. **Goals** for that position –what is it for, a short description |
| 1. **Core tasks and responsibilities**–what's expected to be the goals of the person on this 2. position and what are the responsibilities |
| 1. **Required education level**–could be more than one, for example math and/or computer 2. science - bachelor, PhD, other |
| 1. **Required experience**–in years and in related positions |
| 1. **Required skills**–list of skills required to be successful on this position |
| 1. **Required competencies**–list of competences |
| 1. **Expected behaviour**–how the person is expected to behave, for example to participate 2. in conferences, to be active in on-line communities on topics related to the position etc. |
| 1. **Metrics** used to measure skills/competencies/behavior –measure the performance? Key metrics. |
| 1. **Certification levels** in accordance with the metrics –based on the metrics - scale with different 2. levels. which will probably change his/hr salary too. |
| 1. **Example**(s) |

**The Reference Model**

**= repository of technical procedures to match the case studies as its example of ‘best practices’**

**Profiling Tool – a software tool to determine the ICT role from educational qualifications and experience, that human resources can use to see how the case studies above and the reference model are used to determine the role and grade level of staff.**

**Certification of Professional in**

**e-Infrastructure career**

***Figure 1. The Competencies Framework, Reference Model, Profiling and Certification***

***Stakeholder Surveys with the ‘Ecosystem of Knowledge’ – to gather knowledge for e-Infrastructure career definitions and issues – WP3***

Our third work package is based on the planning the ‘ecosystem’ discovery knowledge based network of seminars and workshops for stakeholders. This is to make a proper survey of all stakeholders and gather all inputs possible for the project.

We will request participation from key universities, companies, standards groups and associations across Europe demonstrating that our PERITIA is a project in the European e-infrastructure sector, and be invited to join our “PERITIA network.” This would create the ecosystem of members for a dialog of stakeholders that will give a rich set of answers to our questions regarding the requirements and key issues to be addressed for the project, mark them in order of priority – major or minor. E-Infrastructure careers are based on such highly trained and complex sets of skills, it is appropriate to involve industry and standards groups at the highest level to set competency standards definitions, and achieve the correct ‘best practices.’

The ‘ecosystem of knowledge’ format organises these interactions with key actors to establish the needs and requirements of the stakeholders. So the context and environment of the actors will be analysed also to see what the general requirements of the project are, and what the main players are going to be. When the stakeholders are clearly identified, and all aspects considered, a requirements specification can then be made to give a general overview of the project and its scope.

* Influences of external environment
* Analysis of stakeholder theory
* Theory of organisational management
* Plan Ecosystem and Send Invitations

***Renditions for Coordinating Management of Seminars, Workshops, Meetings***

We will be making many representations and presentations at the seminars, workshops and meetings to integrate the communications between all stakeholders and encourage active and lively dialog. We will be required to coordinate and chair meetings and elicit fact-finding method throughout. Then all recording of the proceedings and meeting minutes and sessions to be done and made accessible to the website.

The project PERITIA will have two main websites for communications - publication of ongoing results and issues for display, to support networking and information sharing:

1. ***Ecosystem website*** – ***WP3*** for development of the new support websites, blogs, twitter and social media for the professional bodies established for e-infrastructure staff. We will design a prototype website with examples of features and links to all important standards groups and professional links. The website will display findings and work and results of seminars and workshops. Social media networks such as Twitter and Facebook will also communicate more news updates.
2. ***Professional Association Website WP7,*** that also displays popular links, with other professional bodies and interested groups, but most importantly it shows how the certification process is achieved with the Reference Model of competencies, defined in the case studies and best practices of WP5 and WP6, in the centralised state of the e-Infrastructure dedicated career website on a national and international level.
   1. **Concept and Approach**

The concept is to define a professional body to help define the roles, values and practices for e-infrastructure personnel to satisfy society’s needs, and to provide guidance to improve their training and development. We will define a competency model to help define the roles for the career definitions, and we plan to follow on the work of the European e-Competence Framework for ICT Users - Part 2: User Guidelines [[2]](#footnote-2). The project makes a broad strokes definition with an e-competence framework for ICT Users, and supports the creation of a general framework that serves a variety of groups through the provision of a common reference system, its great merit being that it allows practical solutions to real-world challenges.

This is directly related to Key Action 11 of the Digital Agenda for Europe, namely to *“…develop tools to identify and recognise the competences of ICT practitioners and users, linked to the European Qualifications Framework and to EUROPASS…*”.

The eleven partners in the project represent nine European countries in the related fields of e-Infrastructure: there are five universities. Our partners have significant experience in e-Infrastructure with already practicing e-Infrastructure experts, Research Technologists, Computation Experts, Data Scientists and data. The professionals in e-Infrastructure have made significant and essential contribution to the research and applications conducted in our partner institutions and companies and there are matured cases for the proposed reference framework in each partner organisation. Furthermore, each partner organisation is active in one aspect of e-infrastructure related research and applications, and has connection to many related professional organisations and other stakeholders in our society. For example, De Montfort University has connections with hundreds UK and international universities.

**Approach** -The results of the SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), we assembled a consortium of members to address the issues required for the tasks of creating a new profession. In the framework of a SWOT analysis, we match our work packages with consortium partners and describe how the partners will perform the creation of this new profession, working together with combined synergy.

Also based on the idea of “champions” of the SWOT analysis, the consortium will collect the innovative best practices in research and industry , and then communication and exploitation of ‘ecosystem of knowledge’, with seminars and workshops, and will be widely promoted and distributed by the consortium by the websites.

**1.3.1 The Standards for e-Competencies Work Packages WP5 and WP6 and WP7**

For the work packages WP5 and WP6 and WP7, the Competencies Framework and Reference Model and Professional Association work packages, we have a European group of four Partners - personnel working together for several years on the CEN project e-CF into SMEs for EU standards.

**Sebastiano Toffellioni** – ‎**Secretary General of PIN-SME**, is the Pan European ICT & eBusiness Network for SMEs, and their work in the Grand Coalition for Digital Jobs - The role in the Coalition is a founding member of a secretariat for the Grand Coalition, active since the beginning of 2014. Furthermore PIN-SME is an active stakeholder that contributes to the development of e-skills standards at CEN, the European standards organisation.

***“Our Pledge: a standard for e-skills in Europe”***

PIN-SME promised to support the adoption and take up of the e-Competence Framework as European standard for e-skills, extract from [www.pin-sme.eu](http://www.pin-sme.eu):

"*While ICT is a driving force for Europe’s economic and societal changes, companies and especially SMEs strive to recruit skilled people that can power their growth. The differences among the formal education systems in the various countries and among the private trainings and certifications schemes, which compete in the market, create a highly fragmented panorama of ICT competences. Such fragmentation harms the mobility of ICT practitioners in Europe curb SMEs’ chances to hire skilled labour. The members of PIN-SME recognize the need to tackle the e–skills shortage and support the harmonization of ICT competences in Europe under the e-Competence Framework as a European standard. "*

*The progress towards the pledge -*

*For the last 6 years PIN-SME and its experts have actively contributed to the work of the CEN Workshop on ICT Skills,that among other technical specifications, published the first version of the e-Competence Framework. A important development in the standardisation process occurred in 2013, when upon an initiative of a CNA, the Italian member of PIN-SME,*

*CEN created a formal technical body in charge of publishing the e-Competence Framework as European standard for e-Skills, the CEN PC 428 Professions for (ICT)*."

* **Clementina Marinoni** - Head of UNIT, HR Project Promotion and Development, Fondazione Politecnico di Milano, as listed below, she is an expert in the field of standardisation of EU competencies, working **with Sebastiano Toffellioni** and our other partner **Vera Ilieva from BASSCOM** on defining competency models for the ICT sector.

Head of UNIT at Fondazione Politecnico di Milano - She is an active CEN workshop participant and an appointed CEN/European Commission expert. Since 2004 she has been working at the European e-Competence Framework/e-CF, as methodological leader, and led the CEN project e-CF into SMEs.

She is also a member of the Reference and Core ESCO Group "ICT service activities", revising and updating at European level - “the multilingual classification of European Skills/Competences, qualifications and Occupations”; Rapporteur in the UNINFO Technical Committee on “non-regulated profession activities – professional profiles in the ICT sector”; UNI national delegate for the CEN PC/428 "e-competences and ICT professionalism";

* **Vera Ilieva - Project Manager with BASSCOM also** have direct experience working on standards for the definition of ICT roles, working **with Sebastiano Toffellioni of PIN-SME** at a national level - the Bulgarian Association of Software Companies - BASSCOM , is a non-profit industry association representing the ICT industry.

BASSCOM is a co-founder and active member of PIN-SME, and is involved in several initiatives in order to position ICT certifications in accordance with the e-Competence Framework (e-CF) and the European Qualifications Framework. BASSCOM is represented at the TC 428 is a CEN Technical committee on e-Competences and ICT Professionalism.

* Ivan Dragoev of **CompletIT** who has also worked on the standards defining work for case studies for the competencies for ICT role profiling with BASSCOM, and also works on website and Cloud technologies - is specialized in design, development and online marketing for high-end web, mobile and cloud software solutions.

**1.3.2 Work package technical expertise WP4, WP5, WP6, WP7**

For our ‘State-of-the-Art’ and technologies work packages we have the following expertise on the team, that will integrate with the ‘ecosystem of knowledge’ fact-finding seminars and workshops with all the areas we need to cover.

* **Dr Yingjie Yang** of Department of Computational Intelligence, De Montfort University has published over 80 papers on grey systems, fuzzy sets, rough sets, neural networks and their applications to e-Infrastructure problems in civil engineering, transportation and environmental engineering. Dr. Yang is also a senior member of IEEE Systems, Man and Cybernetics Society, a co-chair of IEEE SMC Technical Committee on Grey Systems and the vice-chair of the Task Force on Competitions for Fuzzy Systems Technical Committee of IEEE Computational Intelligence Society. He is leader of the Work Package for State-of-the-Art to describe the latest technologies for the Reference Model of competencies.
* **Dr Simon Wong** of National University of Ireland – Irish Centre for High End Computing (ICHEC) is an adjunct lecturer (Discipline of Information Technology) and leads the education and training activities at ICHEC that include provision of courses, accredited university teaching, industry training and pan-European training coordination (e.g. the establishment and operation of six PRACE Advanced ***Training Centres in Europe***). He also in charge of bioinformatics support at ICHEC enabling high-end computational research for the bioinformatics community, which includes PhD mentorships in collaboration with universities.
* **Dr. Michael Browne** is the Technical Manager at ICHEC,
* **Ms. Nicola McDonnell** coordinates project management activities within ICHEC. She has many years of technical and managerial experience within HPC while working at ICHEC and EPCC (University of Edinburgh
* **Ms. Emma Hogan** is a Data Analyst with HPC, FMCG, biomedical, financial and pharmaceutical industries. She is the PRACE-3IP WP3 Leader and PRACE-4IP WP3 Co-Leader. She holds an BA in Economics & Business from Trinity College Dublin, an MA in Economic Policy from the National University of Ireland, Galway.

**Cincis Ltd**

* **Dr Maureen OFlynn** - Cincis Ltd, High Performance Computing and Data Analysis topics, CEO of Cincis Ltd

**Previous project activities:**

ICHEC is the Irish representative in the series of Partnership for Advanced Computing in Europe (PRACE) projects funded by the EC, where it plays a leading role in the Training, Dissemination and Outreach work packages. ICHEC organised the inaugural and highly successful Summer of HPC programme in 2013 and hosted three European students that year. ICHEC is heavily involved in the organisation of the International HPC Summer School every year in collaboration with HPC organisations from the U.S., Canada and Japan, and hosted the 2012 instance of the school in Dublin. ICHEC also led the establishment of a network of six PRACE Advanced Training Centres in Europe and continues to coordinate their operations that delivers over 70 courses for over 1,500 researchers from all over Europe annually.

Partnering with General Motors (GM), ICHEC developed and delivery of a new 'Diploma in Applied Science entitled ‘HPC System Design & Development' and funded by the Irish Springboard programme[[3]](#footnote-3).This programme offers free courses at certificate, degree and master level leading to qualifications in areas where there are employment opportunities in the economy. GM provided placements for all eleven students signed up to the programme and it is expected that employment of students immediately following the programme, which is due to end in Q2 2015.

**1.3.3 Education work package WP8**

For the educational aspects of the PERITIA project have two world class academic leaders in the field, and several team experts on the Partner panel, one from the European University of Cyprus, and University of Haifa as described in detail next. By having these partners we are in a unique position to advise and determine the educational requirements of the e-Infrastructure certification processes that determine the profession and its definition.

* University of Haifa has a team that has an extended expertise in statistics education, statistical literacy, and educational technology, and is currently studying issues related to big data and data science. **Dr Dani Ben-Zvi** (PI) is a senior lecturer in the Mathematics Education and the Learning and Teaching Departments, founder of the Educational Technologies Graduate Program, in the Faculty of Education, University of Haifa, Israel. He had a major role in the establishment of the prestigious Learning in a NetworKed Society (LINKS) Israeli Center of Research Excellence (I-CORE) on “Co-creation of knowledge in technology-enhanced communities of learning” (LINKS research team, 2012). The technology-enhanced learning communities as means to make complex domains such as statistics more accessible to learners is a field of his studies (Ben-Zvi & Garfield, 2004).
* **Professor Maria Meletiou** as director of the Research Laboratory in ICT-Enhanced Education (ICTEE) that is committed to promoting the best in educational technology (Meletiou-Mavrotheris, M., and Mavrotheris, E. 2006), through the conduct of high quality research that can stimulate effective innovations and improved learning outcomes. She participated in the **EUGENE project FP7** (<http://www.eugene.unifi.it/>) “The EUGENE Network aims at improving the impact of European Engineering Education (EE) on competitiveness, innovation and socio-economic growth in a global context.”

**1.3.4 Software design and maintenance work packages WP3 and WP7:**

For work package 3 and work package 7, and work package 10 the two websites, we have two partners who can maintain the website software as well as contribute to the PERITIA project overall in a cost effective way:

1. ***Ecosystem website*** –Partner **CIT DEVELOPMENT** will do this - for development of the new support websites, blogs, twitter and social media for the website will display findings and work and results of seminars and workshops. Social media networks such as Twitter and Facebook will also communicate more news updates, then becomes the FINAL website dispays.
2. ***Professional Association Website WP7,*** - Partner - **CompletIT** Ivan Dragoev - will maintain a website for the certification processes and that also displays popular links, with other professional bodies and interested groups, but most importantly it shows how the Reference Model works, with the profiling tool for role determination etc.

**CompletIT** - is specialized in design, development and online marketing for high-end web, mobile and cloud software solutions. CompletIT expertise covers user interface and user experience design, programming and social media marketing for the website design.

**1.3.5 Societal challenges and social inclusion work package WP9**

The purpose of work package nine is to address the societal issues that e-infrastructure profession creates and how there are great implications with how technologies of Big Data being handled and analysed, or stored and how it influences society as a whole. The work package leader is the University of Economics in Bratislava (EUBA), the core research areas of UEBA academic staff are related to the knowledge economy, innovation economics, new forms of governance, sources of economic growth and competitiveness; globalization, financial markets dynamics and regulation. Also, the interdisciplinary research has intensified, esp. in the field of biomedicine and new materials with the use of e-infrastructures.

To show how important e-Infrastructure careers will be, it was predicted that successful harnessing and exploitation of current and future e-infrastructure platforms in EU economies could lead to an increase in Europe’s GDP of up to 3% within 10 years, due to:

* The HPC supply chain (potential to add 0.5% to 1% to Europe’s GDP by 2020)
* Industries that leverage HPC to improve their products and services (potential to add 2% to Europe’s GDP by 2020)[[4]](#footnote-4)

Professor Maria Meletiou and Haifa University (Dr Ben-Zvi) will also be working on reports and the challenge of **Statistical Learning and Economic Research**. This is how education and the issues of learning can be addressed regarding the e-Infrastructure career and profession. Professor Meletioou and Dr Dani Ben-Zvi teach a new field of science called Statistical Education – that is a new direction in teaching to make the science of Big Data and Statistics a new doctoral field and breaking ground in their research for this new field of e-Infrastructure learning.

**2 Impact**

**2.1 Expected Impacts**

This is a Coordination and Support Action, to design careers for e-Infrastructures and provide recognition for work achieved by Data Scientists, Computational Scientists, Web designers, programmers and other highly qualified and trained technical staff. Technical supporting work in e-infrastructure requires knowledge and skills on many different disciplines, such as HPC hardware and software, statistics, databases, data mining, visualisation, networking, optimisation and data related specific domain knowledge, etc. Due to the dynamic development of data science, new technologies are appearing all the time, which requires a dynamic tracing of the State-of the-Art in the latest e-infrastructure development.

These new professions are vital to researchers and librarians and to the economies of Europe in general, how to establish professional bodies, recognition and standards for this career. There is a predicted forecast of a great lack of these staff in the future as Big Data projects arise with great frequency, as more and more research projects require digital content data analysis and storage handling. We will look at what is happening at the corresponding jobs in industry, to more fully address the topic of e-infrastructure careers in general.

**2.1.1 Education is the key**

The consortium we have assembled have a unique combination of talents that can address the complexity of creating a new career definition or profession. The academic partners are at the cutting edge of e-infrastructure sciences. As a result, we are able to assess **the number of high level education institutions offering degrees for e-infrastructure experts, research technologists, data scientists and data librarians, and open the subject out for lively debate in our ecosystem of meetings/webinars.**

**With the established network, websites and web forums, as well as the increasing number of high education institutes, graduates and practitioners in these fields will then have more access to degrees, programmes and information sharing tools to improve their skills. The successful implementation of the proposed project:**

* **will promote e-infrastructure in high education institutes in each European country so as to ensure that the majority of European researchers have access to training on e-infrastructures to develop related skills.**
* **By doing so in each European country, the number of individuals able to design, develop and maintain e-science tools and services as well as to support researchers with computational and data expertise will certainly increase significantly**.

We wish to address how to provide professional recognition with professional bodies and certifications and in so doing provide a forum for real recognition for their work and career structures. With recognised official certification of educational qualifications by a Professional Association (*figure 1 –Certification*) we estimate that this would encourage e-Infrastructure personnel to gain the required educational qualifications for the next grade or level if presented with a structured career path in this way.

* + 1. **Continuation of European Standards – e-Competency**

The project will seek to communicate our Competencies Reference Model to stakeholders such as the standards bodies and national and international representative bodies for the software industry that can use it directly. It is an extension of the e-Competence Framework (e-CF) developed with the workshop document for European ICT Professional Profiles. The workshop discusses the core competencies needed in general terms, and our model will provide real practical detail for certification and role determination. Many groups, from employers’ human resources, to job agencies, to international standards bodies, to national industry representatives, would be able to use the model to harmonise their view of e-infrastructure careers. In this way, a real recognition of qualifications and experience of e-infrastructure staff can take place, and the promotion of their career can be made easier as the profile of benefits becomes tangible.

We propose a website of the professional body of the e-Infrastructure (Professional Association) to be central site of professional information about certification and qualification processes. Our work will be displayed on this site, as a continuation of the e-Competency Model for ICT jobs, the competences of ICT practitioners and users, linked to the European Qualifications Framework and to EUROPASS, and will have the following agendas:

* To develop a Competency Framework for e-infrastructure career role definition that is **directly extending EU standards the e-Competency model from CEN for ICT Professionals**, thanks to work from our Partners PIN-SME, Fondazione Politecnico di Milano, BASSCOM, and CompletIT technologies SME who have all worked on standards definitions of competencies for ICT professionals. With the Reference Model define the technologies and standards for the role, fitting into the competency framework
* Recognition by a national and international Professional body or Association according to qualifications and skills and certifications by the professional body can then be reflected by human resources pay scales systems
* Develop a human resource management system that is responsive to career development needs and provides promotions and adequate pay scales .A Profiling tool – software that can be used by Human resources to differentiate e-Infrastructure jobs and career paths

How to design a human resources system that will empower and recognise the skills and abilities of staff in e-infrastructure? This approach will enable human resources to reward higher achievements and greater qualifications according to a gradation scale, and specialised work and experience can be recognised accordingly.

* + 1. **Diversity Issues**

The PERITIA project is **gender balanced** with representations from female and male directors of Partner programs – Dr Maureen O’Flynn Cincis Ltd, Professor Maria Meletiou from European University of Cyprus, Vera Ilieva of BASSCOM, Clementina Marinoni Head of UNIT, FRM, Nicola MCDonell of National University ICHEC.

In WP8 and WP9 will take account of diversity, with special attention to increasing participation in education for groups at special risk of exclusion from scientific studies and careers:

* *Provision for gender equity:* While education gaps are closing in the EU, Gender-role stereotyping continues to pervade women’s choice of programs of study and occupation (Agars, 2004; Blau and Kahn, 2000; Joy, 2000; U.S. Department of Education, National Centre for Education Statistics, 2005).

At the secondary level, results from PISA (Education International) report that 15 year old girls are less interested in science than their male counterparts. At college level, interest in science studies is also declining. These results are of critical importance to the PERITIA project. Partners Professor Maria Meletiou from University of Cyprus and Dr Dani Ben-Zvi will be studying these issues as world experts in the field of education and social inclusion, with a particular view of addressing the issues from where they begin – at school stages.

As director of *SimSchool-Science* (Web-Based Simulations for Teacher Education ) FP7 project Professor Meletiou describes how in the face of increasing demand for science graduates, female students are still lagging behind in enrolment in science and technology careers (Weinburgh 1995; European Commission 2004; Miller, Slawinski Blessing, & Schwartz 2006), However, despite these differences, it has been found that females will perform at the same level as males when they are given the right educational tools (OECD, 2008).

**2.2 Measures to maximise impact**

1. **Dissemination and exploitation of results**

The plan for dissemination and exploitation of results we propose a website for ‘ecosystem of knowledge’ the exploitation of results of the project, to show the reports and results of dialogue with stakeholders through the project.

The results of the models for career design are displayed on the second website – for the test Professional Association - the progress of recognition of the profession, and highlight the progress with the Reference Model case studies, with updates to the ‘best practices’.

* **Final reports and results website** to show the project results, from the ‘ecosystem of knowledge’ website results, with final reports, and other documentation displayed according to the projects requirements as a final display.
* Also a **test website for the Professional Association** will be a prototype of the professional body’s website – with all the relevant information involved, this website will be a prototype of the central website for professional e-infrastructure personnel for their profession and all its information and links. This website can use the Reference Model as a guide for certification processes and qualifications guide. The certification processes and the profiling tool will be made available from this final website to show how the Professional Association website can display the central way of determining the roles and the job design of e-infrastructure careers.
* Connection with related professional bodies in each country will be explored to provide a mechanism to certify qualified professionals in e-infrastructure. The website will use the Reference Model for the proposed plans for a professional body to provide certification. It will also provide surveys of career options and salary levels for European e-infrastructure jobs, similar to those found in the US, to encourage more candidates, as the salaries in industry can be very high but are under-reported on this side of the Atlantic.
* A number of outreach meetings and seminars will be held by partners to promote e-infrastructure as an independent career path and discipline, as the final stage of the ecosystem of knowledge, the education work package will have seminars for the recruitment at secondary and third level educational systems.

With the two websites for display of the results and reports the project can show its findings and the software for the profiling tool for HR use to see what roles can be defined from different input.

1. **Communication activities**

The activities planned with the ecosystem of knowledge in the PERITIA project will, over the life of the project, raise many collaboration opportunities, and exchange of ideas. A large and varied group of stakeholders will be together, with specific focus on the Human Resources and role definition with lifelong learning possibilities. We will explore different communication methods for raising the profile of the e-Infrastructure careers in general and e-skills training courses, life-long learning issues and for getting recognition for the professional’s work.

Several work packages involve communicating with industry leaders, providing certification processes already as a starting point. We plan communication with networking websites and blogs to add information about careers and training courses, as well as a dedicated test Professional Association website with links to other sites of interest etc. In essence, the ecosystem of knowledge community will include actors from both the industry and also have stakeholders from policy bodies, EC representatives, the press and media organizations, academic and research institutes.

PERITIA seeks to build a community of strategic stakeholders from all over Europe to focus special attention to ensure a balanced representation from university e-infrastructure and also industry and policy standards groups. The Education work package also illustrates the importance of communications at school education level as well as tertiary level, and we describe our outreach plans for this. The potential for communicating the strength of the group’s definition and their abilities cannot be underestimated, and the future of Europe economies is in our hands.

1. **Implementation**
   1. **Work Plan- Work packages, deliverables and milestones**

**Work Packages**

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| --- |
| 1. Project Management and Risk Analysis |
| 1. A Review of business processes -- Current Policies, Standardisations and Regulations of e-infrastructure professions |
| 1. Stakeholder theory – An Eco-system of Knowledge – the context of Actors for the e-infrastructure career aspects and issues |
| 1. Review of what is the ‘State-of-the-Art’ for e-Infrastructure |
| 1. The Competency Framework – role definitions |
| 1. A Reference Model: Implementation -Case Studies with Sets of Best Practices demonstrations of prototypes |
| 1. Professional Associations and Certification Processes |
| 1. Education and e-Infrastructure Careers |
| 1. Societal Challenges and Social Inclusion |
| 1. Dissemination and exploitation of Results, Communications |

**Work Packages**

**WP1** To plan and guide the administrative part of the project, to monitor and control the work packages overall, as well as supervising milestones and deliverables.**WP1** also covers the assessment of Risk Analysis and the evaluation of Quality Assurance standards of the project.

**WP2 provides** the background for the policies and standards for qualifications and certifications with the EU for ICT staff which we plan to extend, such as the e-Competency Framework, (e-CF),defacto policy and standards from large companies and new research standards.

**WP3** will invite all stakeholders from research, industry and NGOs to seminars, meetings etc. and build a website for the PERITIA ecosystem. We will request inputs and work together in the seminars and workshops within the project activities and display meeting/workshop proceedings on the websites.

**WP4** a comprehensive review of the ‘State-of-the-Art’ of technologies for e-Infrastructure career options, i.e. the technical side of **WP2**.

**WP5** defines the Competency Framework, and determines the different roles in the new careers with frames of the case study set of parameters, and this work package also is working on profiling tools. It provides the framework for the **Reference Model WP6** to synchronise the case studies and best practices as illustrations of practical use of the competencies.**WP6** is to define and create the **Reference Model** that is a technical reference for the framework of a list of competencies that ‘fit’ into **WP5 – the best practice examples corresponding to the case study of the Competency Framework**.

**WP7** explores how the Professional Associations are of benefit to the e-Infrastructure profession, including how the **Reference Model** and Competency Framework can be used to **provide Certification** and hence formal **recognition** through an official professional representative association.

**WP8** provides a view of how education and training is important over a lifetime career in e-infrastructure including curriculum evaluation and up-skilling to keep up with the advancing pace of e-infrastructure technologies. The active promotion of education, e-Infrastructure to address the issue of staffing levels dropping below, certification valuations.

**WP9** Societal Challenges and Social Inclusion give the broader perspective of how e-Infrastructure impacts on our society, and how the role of the Data Scientist, Digital Data Archivist or other roles can impact on our lives. Issues of ethics and social inclusion, gender are also threaded through most other WPs, and will receive high priority.

**WP10** Dissemination, Exploitation and Communication is achieved via the three key websites and the ecosystem of knowledge, and the reports published and made available on the PERITIA website, with final reports also available.

**Work Packages PERT Chart**

**Work Package 1**

**Project Management**

**Risk Assessment**

**Work Package 2**

**Strategy**

**Review of Current Policy and Professions**

**Work Package 3**

**Ecosystem of Knowledge**

**Work Package 5**

**The Competency Framework – role definitions**

**Work Package 4**

**Review of the ‘State-of-the-Art’ of e-Infrastructure**

**Work Package 7**

**Professional Associations**

**Work Package 6**

**The Reference Model**

**Case Studies, Best Practices –**

**Work Package 10**

**Dissemination and Exploitation of Results, Communications**

**Work Package 9**

**Societal Challenges and Social Inclusion**

**Work Package 8**

**Education**

**And E-Infrastructure Careers**

**Project Timing**

Here is the Gantt chart for project planning.

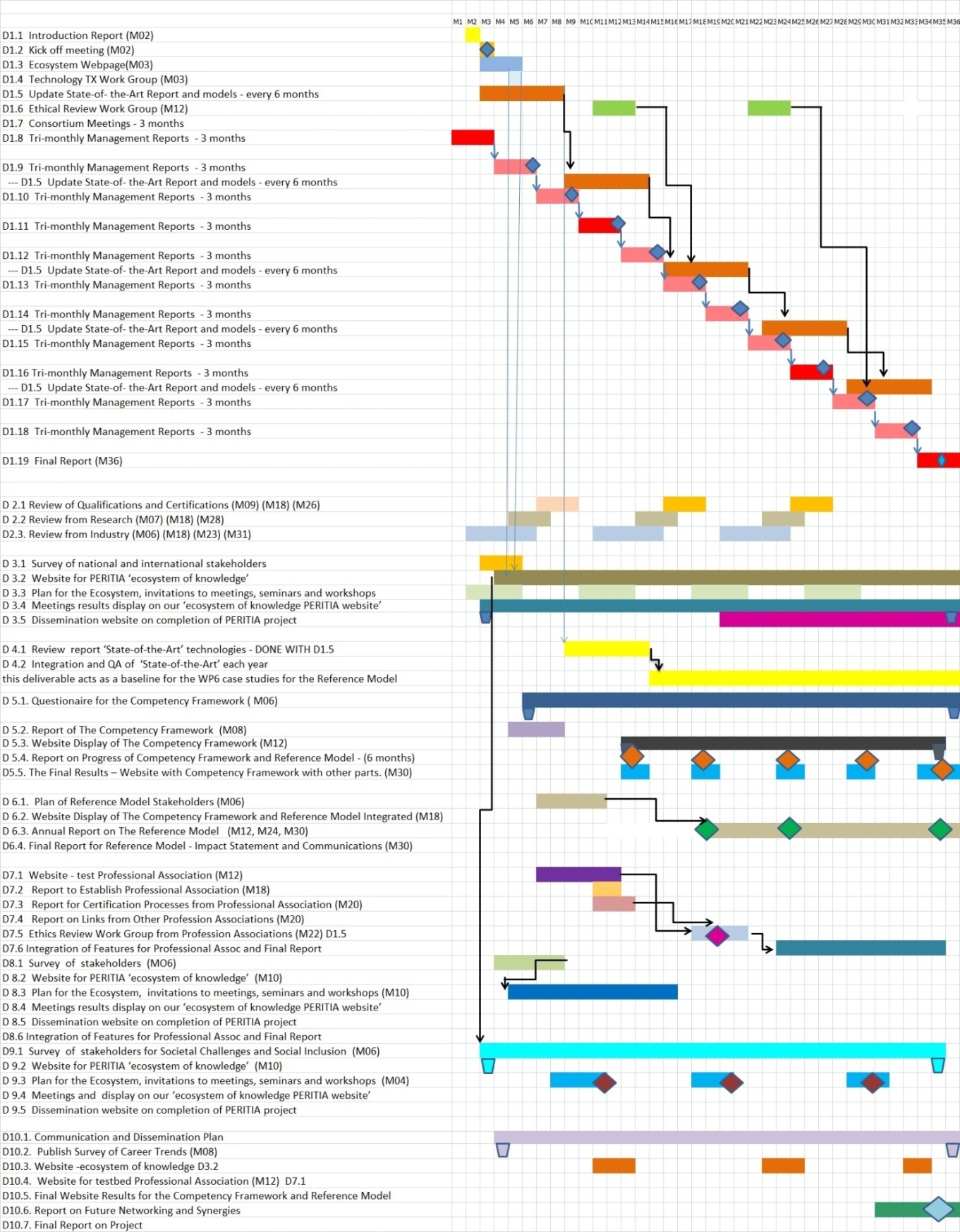


Table3.1 a:Work package description.

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| **Work package number** | **1** | | |  | | **Start Date or Starting Event** | | | |  | |  | |  | |
| **Work package title** |  | |  | |  | | **Project Management** | | | | | | | | |
| **Participant number** | **1** | 2 | | | 3 | | 4 | 5 | 6 | | 7 | | 10 | | 11 |
| **Short name of participant** | **Cincis** | BASSCOM | | | EUBA | | CIT DEV | EUC | CompletIT | | DMU | | NAT UNI | | UNI HAIFA |
| **Person/months per participant:** | **22** | 1 | | | 1 | | 1 | 1 | 1 | | 1 | | 1 | | 1 |

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| **Objectives**   1. To plan and guide the administrative part of the project 2. To evaluate quality assurance standards of the project where necessary in collaboration with the scientific experts of the PERITIA consortium team 3. To sign official project documents. 4. To administer and distribute the European Commission funds in a timely fashion and to keep records of such financial allocations (informing the European Commission of such allocations when requested). 5. To ensure that work packages are carried out according to the timetable, and to advise partners on what work needs to be performed. 6. To identify potential problems at an early stage and provide timely and effective solutions. 7. To implement a review and assessment structure to monitor PERITIA with respect to objectives, milestones, deliverables and the Consortium Agreement. 8. To liaise with the Project Officer in Brussels and be the link between standards groups and the European Commission. 9. To coordinate the project PERITIA while fulfilling all legal requirements of the European Commission. |

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| **Description of work** (where appropriate, broken down into tasks), lead partner and role of participants  **WP1** aims specifically to ensure that the project is appropriately managed in all relevant aspects and that the different tasks are performed according to the project plan. It also aims to ensure that specific results are delivered on time and are obtained within the budgets. This includes support to partners in reporting on scientific, financial and administrative procedures, and provision of assistance and advice to project partners regarding administration and reporting.  **WP1** will have the responsibility of controlling the quality if the performance, developments, achievement of milestones and deliverables. A policy to ensure high-quality standards is to be determined throughout the life of the project, to ensure the highest standards of work evolved.  **WP1** will also comprise risk management. This will entail identification, assessment and follow-up of threats and opportunities, with SWOT analysis. Risks will be identified in communication with all WP leaders and assessed and actions addressed to affect probability and/or impact before the risk happens will be defined and actions to be carried out.  **Description of work**  **Task 1.1. Day-to-day management**  The aim of the daily management is to see to that PERITIA project is running smoothly, that problems arising are resolved, that reports are written in a timely manner, and that the participants receives support in the following areas:   1. Support to WP leaders in day-to-day management and decision-making 2. Review of reports to verify consistency with the project tasks before transmitting them to the European Commission. 3. Coordination of the updating of communicating documentation 4. Work plans control and update. 5. Assurance of timely submission of deliverables. 6. Support to meetings organization and meeting minute’s production. 7. Implementation of derived actions into the work plan, and follow-up. 8. Consideration of gender aspects and other social inclusion issues such as disability, ageism 9. Assess risk management 10. Management of quality control procedures on deliverables and other project results   **Task 1.2. Reporting and Administration**  Reporting and financial procedures in EU-funded projects, this activity will be devoted to:   1. Financial management: cost control and justification, budget management, European Commission contribution distribution, contractual obligations of the project. 2. Reports. Setting up of reporting mechanisms, providing education and support to partners in appropriate reporting, including facilitation of the task via web-based systems as needed. 3. Special attention will be paid to help partners manage the relationships between financial flows (budget, funding, justification, expenditure, payments).   **Task 1.3. Contract and Legal Management**  This task will deal with all contractual and other legal issues related to the project. In particular, it will comprise Consortium Agreement implementation and amendments, and the related procedures. Of special relevance given to accession of new partners, withdrawal, relationships with external collaborators, etc. and formalising updates of the work plan, roles and resources assignment.  **Task 1.4. Project Coordination**  In order to provide good overall strategic direction at the EU standards and management levels, the project coordinator will be aware of other related projects globally, establishing good lines of communication with those projects, and forging collaborative partnerships as appropriate.  **Task 1.5. Project Quality and Assessment**  High quality standards will be applied to all the work undertaken. Good performance will be a principal feature of all project interactions, and this will be achieved through the development of a productive culture of openness about achievements. To closely monitor project progress, frequent communications will take place (e.g., at least monthly) between the coordinator and the WP leaders.  **Task 1.6. Ethical Issues**  This activity will provide ethical oversight, analysis, and guidance for a new profession. As a starting point for the guidance, we will identify key ethical issues in the project. These will include, among others, informed consent, privacy protection, and anonymous data at all publicly visible levels.  **Task 1.7. Technology Transfer**  This activity will provide support for the project when it comes to matters of Intellectual Property Rights (IPR) management. Prior to publication or other dissemination of results and/or information, the Technology Transfer Work Group may perform its own assessment of the data to ensure that any patent protection is not compromised. |

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| **Deliverables** (brief description and month of delivery)  **D1.1** Establishment of a Management Introduction Report for all Partners (M02)  **D1.2** Kick off meeting, a signed consortium agreement and Project presentation produced (M02)  **D1.3** Establishment of an Ecosystem of Knowledge Advisory Group and the establishment of a webpage with password-protected info for Ecosystem Display(M03)  **D1.4** Establishment of Technology Transfer Work Group for Competency Framework and Reference Model databases (M02)  **D1.5** Quality Assure the update the Framework and Reference Model according to State-of- the-Art technologies (M12)  **D1.6** Establishment of Ethical Review Work Group – Re: WP 2 and WP8: Societal Challenges and Policy (M03)  **D1.7** Organisation of the Consortium Meetings of the PERITIA group – every 3 months hosted in different Partner member states (M03, M06, M09, M12, etc.)  **D1.8** Tri-monthly Reports with minutes and actions from PERITIA meetings(M03, M06, M09, M12, etc.)  **D1.9** Final Report from PERITIA project (M36) |
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| **Work package number** | **2** | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** | **A Review of the Current Policies, Standardisations in Europe** | | | | | | | | |
| **Participant number** | **1** | 2 | | 3 |  |  |  | |  |
| **Short name of participant** | **Cincis** | EUBA | | CIT DEV |  |  |  | |  |
| **Person/months per participant:** | **6** | 2 | | 2 |  |  |  | |  |

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| **Objectives**  The key objectives come from current policies and standards for qualifications and certifications with the EU for ICT staff which we plan to extend. Examples of these documents and studies are the European Qualifications Framework that harmonises university qualifications, the e-Competency Framework, (e-CF), the Grand Coalition for Digital Jobs, the workshop for European ICT Professional Profiles that describes core competencies for the software industry.   1. Review current policies and standards for qualifications and certifications for e-infrastructure personnel working with research in industry in Europe and globally. 2. Review trends from research standards such as ieee/ACM inputs indicating the future of e-Infrastructure and its careers paths 3. Review defacto policy and standards from large corporate white papers and studies 4. Analyse and assess future directions for current policies to allow Europe to be competitive in defining for professional recognition for e-infrastructure personnel. 5. Work with WP 3 ecosystem of knowledge to gather stakeholder information about the current policies and standards that exist and how the e-Infrastructure profession is defined. 6. Review popular websites, Social Media and blogs with tacit knowledge and social interaction from e-Infrastructure groups to determine the popular culture medium. |

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| **Description of work**  **Task 2.1. Review of Current National and EU Policies and Standards (M06)**  Review current policies and standards for qualifications and certifications for e-infrastructure personnel working with research projects and in industry for Big Data projects, with large amounts of data and data analysis. The aim of the review will be to analyse and compare the progress and potential for our project.  **Task 2.2. Review of Current Research Policies and Standards(M07)**  Review trends from research standards such as ieees/ACM inputs indicating the future of e-Infrastructure and its careers paths. The fields of e-Infrastructure are new even in research and we can learn about the direction of the profession from the new groups forming in the research communities by assessing them.  **Task 2.3. Review of Current Defacto Industry Standards (M09)**  Review defacto policy and standards from key performers from industry with whitepapers from key industry players and other media. WP3 ecosystem of knowledge will provide a stakeholders view of the project.  **Task 2.4. Future Directions for Current Policies and the e-Infrastructure Profession**  Analyse and assess future directions for current policies to allow Europe to be competitive in defining the career structure and professional recognition for e-infrastructure personnel. By examining current standards and regulations, and how the career opportunities are determined, in comparison to the US and globally, see how our new approaches for a profession need to be designed to be of true world-class significance. (M12)  **Task 2.5. Work with WP3 ecosystem of knowledge to gather stakeholder information (M03)**  Work with WP3 ecosystem of knowledge to gather stakeholder information about the current policies and standards that exist and how the e-Infrastructure profession is defined (M03)  **Task 2.6. Review of Popular Web Culture (M14)**  Review popular websites, Social Media and blogs with tacit knowledge and social interaction from e-Infrastructure groups to determine the popular culture medium. |

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| **Deliverables**  **D 2.1** Deliverable Review document of current policies and standards for qualifications and certifications for e-infrastructure(M06)  **D2.2**. Deliverable Review of defacto policy and standards from large corporate white papers and studies with analyse of future directions for current policies - Working with WP 3 ecosystem of knowledge to gather stakeholder information about the current policies and standards that exist and how the e-Infrastructure profession is defined. (M07)  **D 2.3** Deliverable Review document of trends from research standards such as ieee/ACM inputs indicating the future of e-Infrastructure and its careers paths (M09)  **D 2.4** Deliverable Review document of trends from popular web culture inputs indicating the future of e-Infrastructure and its careers paths (M12) |

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| **Work package number** | **3** |  | | **Start Date or Starting Event** | | | | | |  | |  | |
| **Work package title** |  |  | **Stakeholder theory and an Eco-system of Knowledge – the context of Actors for the e-infrastructure career aspects and issues** | | | | | | | | | | |
| **Participant number** | 2 | 3 | | | **3** | 5 | 6 | 7 | 6 | |  | | 7 |
| **Short name of participant** | BASSCOM | EUBA | | | **CIT DEV** | EUC | CompletIT | DMU | FPM | | NAT UNI | | UNI HAIFA |
| **Person/months per participant:** | 3 | 2 | | | **9** | 3 | 2 | 2 | 1 | | 3 | | 2 |

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| **Objectives**  The success of the project depends on the ability to **establish the key stakeholders** involved and to determine the context and environmental influences of the topic in general. In order to get the opinions from as wide an arena as possible we wish to create a European ‘**ecosystem of e-infrastructure knowledge’ -“PERITIA**.”   1. To make a survey of national and international stakeholders to make up the ecosystem and mark them in order of priority – major or minor, all the partners need to get involved with this WP in order to get the maximum from the knowledge gathering. 2. To design website for PERITIA ecosystem is to be established to request inputs and work together in seminars, webinars and workshops within the project activities and display meeting/workshop proceedings. 3. To create a plan for the ecosystem and set out the invitations for stakeholders to join   ecosystem meaning we will invite and add related and important actors at European level in this sectoral market: with seminars, surveys and information meetings of universities, companies, and associations such as (ZCECH ICT ALLIANCE), ETPs, (NESSI, NETWORLD2020).   1. To make representations and presentations at the seminars, workshops and meetings 2. Record the proceedings and meeting minute and sessions ideas to gather fact-finding and information about the e-infrastructure career 3. To produce clearly defined results of our seminars, workshops and interesting findings from e-infrastructure related websites on our ‘ecosystem of knowledge PERITIA website’. 4. To define, through the work of the ‘ecosystem of knowledge’, how the actors will determine these requirements and the deliverable will make a summation of these findings. In this way we start the program with a clearly defined set of aspirations and goals, and a direction for the project from the outset with which to benchmark our progress for the project duration.   The theory of organisational management provides a description of the organisations that are the context for our careers in e-infrastructure. The influences of the external environment are important to consider when defining the overall synergies that will determine the representation of the role definition. |

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| **Description of work**  **Task 3.1. Survey of National and International Stakeholders**  We could request participation from key universities, companies, standards groups and associations across Europe demonstrating that our PERITIA is interesting for the European e-infrastructure sector, and they will join our "PERITIA network". This is the ecosystem of members creating a dialog of stakeholders that will give a rich set of answers to our questions regarding the requirements and key issues to be addressed for the project, marking them in order of priority – major or minor.   * Define stakeholders * Influences of external environment * Analysis of stakeholder theory * Theory of organisational management * Project Requirements Specifications – this is divided into sub-groups for different parts   **Task 3.2.** To Design Website for PERITIA Ecosystem  To design website for PERITIA ecosystem is to be established to request inputs and work together in seminars and workshops within the project activities and display meeting/workshop proceedings.  **Task 3.3. Plan Ecosystem and Send Invitations**  The work in this work package is based on planning the ecosystem discovery knowledge based network of seminars and workshops for stakeholders. This organises these interactions with key actors to establish the needs and requirements of the stakeholders. Thus, the context and environment of the actors will be analysed also to see what the general requirements of the project are, and what the main players are going to be. When the stakeholders are clearly identified, and all aspects considered, a requirements specification will then be made to give a general overview of the project and its scope.  **Task 3.4. Renditions for Coordinating Management of Seminars, Workshops, Meetings**  We will be making many representations and presentations at the seminars, workshops and meetings to integrate the communications between all stakeholders and encourage active and lively dialog. We will be required to coordinate and chair meetings and elicit fact-finding method throughout. Then all recording of the proceedings and meeting minutes and sessions to be done and made accessible in the website.  **Task 3.5. Website for Results Display of PERITIA Ecosystem of knowledge**  The website is dedicated to publish the results from the seminars, workshops, meetings inputs and work together within the project activities workshops and interesting findings from e-infrastructure related websites on our ‘ecosystem of knowledge PERITIA website’.  *This will be created by CITDEV in collaboration with the rest of the partners that will send invitation using a website tool we could implement based on open source / free tools to keep our costs down.* |

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| **Deliverables**  **D 3.1** Make a survey of national and international stakeholders to make up the ecosystem and divide the work between the Partners working on this WP. (M06)  **D 3.2** Design website for PERITIA ‘ecosystem of knowledge’ work for displaying seminars, workshops, surveys and meetings proceedings and general feedback from all stakeholders (M03)  **D 3.3** Plan Document for the Ecosystem - set of invitations for stakeholders and plan of meetings and seminars and workshops per country. (M04, ongoing)  **D 3.4** Record the proceedings and meeting minute and sessions to produce results of seminars, workshops and display on our ‘ecosystem of knowledge PERITIA website’ (M04, ongoing)  **D3.5** Make a final summary of the ecosystem of knowledge website for the communications website on completion of the PERITIA project and display results (M36) |

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| **Work package number** | **4** | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** | **Review of ‘State-of-the-Art’ of Technologies** | | | | | | | | |
| **Participant number** | 1 | **3** | | 7 |  |  |  | |  |
| **Short name of participant** | Cincis | **EUBA** | | DMU |  |  |  | |  |
| **Person/months per participant:** | 2 | **2** | | 15 |  |  |  | |  |

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| **Objectives**  This work package is a review of what is currently is the baseline in terms of the e-infrastructure technologies. It participates in the ecosystem of knowledge to gather feedback and information from sources such as workshops, seminars that can assist us to gain greater insight regarding the state-of-the-art technologies and their future directions.   * Link to WP2: Review trends from research standards such as ieee/ACM inputs indicating the future of e-Infrastructure and its careers paths, and   Review of defacto policy and standards from large corporate white papers   1. To make a comprehensive review of the ‘State-of-the-Art’ of technologies for e-Infrastructure career options 2. To review of future and emerging technology trends and challenges 3. To assess and predict the trends in technological developments and monitor companies and websites that provide information 4. To publish results and ideas on the ecosystem of knowledge website to disseminate interim results of the studies, and solicit further feedback from stakeholders. 5. To keep up-to-date for the duration of the project to provide information to WP5 and 6 for the competencies and Reference Model. |

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| **Description of work**  This Work Package reviews the **‘State-of-the-Art’** current and future trends in e-infrastructure technologies to define most up-to-date systems and platforms in use in a constantly changing environment. By defining these computing methodologies and systems we will be able to design our **Reference Model in WP6**and case studies more accurately, and have a clearer picture how the new technologies are developing in the future.  **Task 4.1. Review of the ‘State-of-the-Art’ of technologies for e-Infrastructure**  This Work Package links with several types of review from WP2, beginning with a literature review of current research topics connected to e-infrastructure topics, to see how the field is progressing as an area of research in its own right. The next area of Review is of e-infrastructure standards development progress, this a review the standards in the fields of e-infrastructure and Big Data, Cloud, etc. It includes a review of the types of standardisation of Professional Bodies.  **Task 4.2. Review of the Future and Emerging Technology Trends and Challenges**  This Work Package reviews the **‘State-of-the-Art’** current and future trends in e-infrastructure technologies to define most up-to-date systems and platforms in use in a constantly changing environment. By defining these computing methodologies and systems we will be able to design our Reference Model and case studies more accurately, and have a clear picture where the technologies are headed in the near future.  **Task 4.3. Ecosystem of Knowledge Website – Publish Reviews and Updates**  The Big Data programming environment is in a state of flux, and requires constant vigilance to verify that we are up to date with our proposal, so we will continue this work package through the project with a new deliverable each year, publish results and ideas on the ecosystem of knowledge website.  **Task 4.4. Prepare Competencies Framework Information**  To provide ‘State-of-the-Art’ baseline technology reviews and keep up-to-date for the duration of the project in order to provide information to WP5 and WP6 for the competencies, best practices and Reference Model. The reviews from WP2, WP3 and this WP4 all combine to gather information to assist WP5 and WP6 to create an accurate model for role definitions for e-infrastructure careers. |

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| **Deliverables**  **D 4.1 Review Report of the ‘State-of-the-Art’ current and future trends in e-infrastructure (M09)** technologies to define most up-to-date systems and platforms- note draws on D2.2 and D2.2 reports.  **D 4.2 Report Document is an Update per annum(M18), (M24), (M30)**  Review of the **‘State-of-the-Art’** current and future trends with input from the ‘ecosystem of knowledge’ seminars.  **D 4.3 The Report ‘State-of-the-Art case studies’ for the Reference Model (M12, M24, M35)**. Review the ‘State-of-the-art’ for each year of the project, the deliverable has a list of possible technologies and their manifestations, and this deliverable acts as a baseline for the Work Package 6– The Reference Model ‘best practices’, updated each year of the project. |

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| **Work package number** | **5** | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** | **Defining the e-Infrastructure Professional Competencies Framework** | | | | | | | | |
| **Participant number** | 2 | 3 | | **6** | 8 | 9 |  | |  |
| **Short name of participant** | BASSCOM | EUBA | | **CompletIT** | PIN-SME | FPM |  | |  |
| **Person/months per participant:** | 2 | 4 | | **12** | 2 | 3 |  | |  |

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| **Objectives**  The purpose of this work package is to define the different roles in the new careers and the profession of the e-infrastructure engineer and scientist. The experience and educational achievements can determine the type of level that the person is entitled to have according to a referencing system of recognition by the HR systems for the newly defined profession. We will define a competency model based directly on the standards defined work of the European e-Competence Framework for ICT Users -supporting the creation of a general framework that services a variety of groups through the provision of a common reference system.   1. To take account of ecosystem of knowledge of stakeholders of opinions and views 2. To define **the Competency Framework**– a common framework with sub-specialties – types and grades of roles, The different grades and roles of progression of the profession depending on experience and qualifications achieved, and how they may be formally recognised 3. Create and test user guidelines for application of framework 4. Develop profiling tools and software assisting methodologies for framework 5. Disseminate our interim and final results of the competency framework 6. Provide a robust and tested framework for the **Reference Model WP6**to synchronise the case studies and best practices as illustrations of practical use of the competencies   This work package defines the types of roles – subspecialties and their corresponding levels of number of years of experience and qualifications, similarly to other professions e.g. medicine, accountancy, etc.  There are different roles and jobs in e-infrastructure, each being a sub-specialty of the general profession of e-infrastructure scientist or engineer.   * The subspecialties of the profession and the skills required by them * The different grades and roles of progression of the profession depending on experience and qualifications achieved, and how they may be formally recognised |

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| **Description of work**  **Task 5.1. Define The Competency Framework for e-Infrastructure Careers**  The purpose of this work package is to define the Competency Framework, and determine the different roles in the new careers and the profession of the e-infrastructure engineer and scientist. The role or level is determined by qualifications and experience according to the model, acting as a referencing system of recognition. These models can then be used by HR departments or an e-Infrastructure Professional Body that may represent the newly defined profession.  **5.1.1Defining the career paths: Each is a sub-specialty of the area of expertise of the person.**  Branches of the e-Infrastructure Profession:   1. HPC – Grid Personnel–working with parallel processing programming 2. Data Analytics – analysing Big Data and storing databases 3. Cloud Computing/Web design– cloud computing 4. Data Scientist – statistical analysis, data mining and database programming 5. Digital Data Archivist – storing and retrieving digital Big Data 6. Data Warehouser – storing large amounts of data 7. Database Administrator 8. Software (Solution) Architect, Back-end 9. Front-end software engineer 10. Security engineer–keeping sensitive data, protecting privacy, secure transportation etc.   **5.1.2.And a structured progression of careers based no experience and qualifications:**   |  |  |  | | --- | --- | --- | | **Job Title** | **Years’ experience** | **Qualification -** | | Junior E-infrastructure engineer | 2-3 | Cert, Degree, masters | | Senior E-infrastructure engineer | 2-5 | Cert, Degree, masters | | Team lead E-infrastructure engineer | 3-10 | Etc. | | Team Manager E-infrastructure engineer | 5-10 |  | | Section Manager | 10 |  | | Chief E-infrastructure engineer | 10 |  | | Head of Department | 10-15 |  |   **5.1.3. A Case Study consists of:**   |  | | --- | | 1. **Name** (alternative names) –Software Architect, Data Analyst | | 1. **Goals** for that position –what is it for, a short description | | 1. **Core tasks and responsibilities**–what's expected to be the goals of the person on this position and what are the responsibilities | | 1. **Required education level**–could be more than one, for example math and/or computer science - bachelor, PhD, other | | 1. **Required experience**–in years and in related positions | | 1. **Required skills**–list of skills required to be successful on this position | | 1. **Required competencies**–list of competences | | 1. **Expected behaviour**–how the person is expected to behave, for example to participate in conferences, to be active in on-line communities on topics related to the position etc. | | 1. **Metrics** used to measure skills/competencies/behavior –how we will measure the performance? Key metrics. | | 1. **Certification levels** in accordance with the metrics –based on the metrics we can prepare a scale with different levels. Thus the person will know what's needed for the next level which will probably change his/hr salary too. | | 1. **Example**(s) |   **Task 5.2. Define User Guidelines for an Application of the Framework**  The purpose of this work package is to define user guidelines for the competency model, and for human resources to establish the different roles in the new careers and the profession of the e-infrastructure engineer and scientist. The roles or level is determined by qualifications and experience according to the referencing system of recognition. Linking with WP2 ecosystem of knowledge to determine how stakeholders find using the competency model with trial runs.  **Task 5.3. Develop Profiling Tools for Competency Framework**  Develop profiling tools and software assisting methodologies for framework, we are going to emulate the profiling tool for the e-competencies website, that makes the selections of profiles and competencies available with a software tool with menus and drill down selections.   * *http://profiletool.ecompetences.eu/*   **Task 5.4. Provide Competencies Framework for the Reference Model WP6**  WP4 provides a baseline of technology State-of-the-Art review, and this work package provides a framework of competencies for the Reference Model **WP6,** and the WP6 provides the case studies with best practices (see diagram in WP6 for clarification of these milestones). These then provide illustrations in WP6 of the technological requirements for each level of attainment of the role definition in the Reference Model. As this is the most challenging WP we draw on several Partners with e-infrastructure experience to work in this WP.  **Task 5.5. Ecosystem of Knowledge – gather input and post interm and final results of the competency framework**  Take account of an ecosystem of knowledge of stakeholders of opinions and views and distribute our interim and final results of the competency framework, with results combining from WP6 – the Reference Model to give a comprehensive referencing system in defining the new e-infrastructure career. |

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| **Deliverables**  **D 5.1. Questionnaire to define the Competency Framework– (M03)**. With sub-specialties **in e-infrastructure** technologies to define most career roles and profiles - note draws on D2.2 and D2.2 and D4.1.  **D 5.2. Knowledge Gathering Report (M06)-**Description of Specialties – Different branches of careers in e-infrastructure-ecosystem of knowledge of stakeholders of opinions and views  **D 5.3. Website - The Competency Framework (M09)**– a common framework with sub-specialties –description of Professional Career Structures and Grade Descriptions  **D5.4. The Final Results – Website with Competency Framework with the Reference Model integration (M12).** To show the use of the Reference Model and the Profiling tool and User Guide and HR supplements for the comprehensive set of e-infrastructure career definitions. |

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| **Work package number** |  | **6** | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** |  | **A Reference Model: Implementation of the Case Study Set of Best Practices** | | | | | | | | |
| **Participant number** | 2 | 2 | 3 | | 5 | **7** | 8 | 9 | | 10 |
| **Short name of participant** | Cincis | BASSCOM | EUBA | | CompletIT | **DMU** | PIN-SME | FPM | | NAT UNI |
| **Person/months per participant:** | 3 | 1 | 2 | | 2 | **13** | 2 | 1 | | 6 |

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| **Objectives**  This work package is at the core of the project PERITIA (*Latin for expertise*) and it is to design the Reference Model that describes the essential skills and practical examples of the competencies – that is the ‘best practices’ that determines the types and levels of expertise in each branch of the e-infrastructure careers. This is a very challenging and important module at the heart of the programme, and we draw on the ecosystem of knowledge to invite specific examples and reviews, and our internal stakeholders’, i.e., the project partners’, e-infrastructure knowledge to develop a comprehensive list of examples. The Reference Model fits with the Competency framework of **WP5,** to show the best practices in practical terms and to allow the model to be used for certification **in WP7**, as shown in the diagram below, we do the reviews of **State-of-the-Art of technologies**, and then determine from that baseline what is the best representation of the **Case Study Competency fromWP5:**  Milestones.jpg  Figure 2.Milestones for Competencies  The objectives for this work packages are as follows:   1. Review insights/opinions of internal and external stakeholders representatives from industry and research to allow for sufficient input for our team to gather and develop the samples and prototypes of ‘best practices’ 2. Define and create the **Reference Model** that is a technical reference for the framework of a list of competencies and corresponding case studies and best practices 3. Illustrate with a User Guide and trial the Reference Model with the Competencies Framework that relate to the e-infrastructure skills and human resources levels of determination for the resolution of roles determining the grade of e-infrastructure professional. Have a resource for support tools and related institutional practices for assisting human resources with career determination in e-infrastructures and career development. 4. Make enhancements to the profiling tools and software assisting methodologies for framework to add the Reference Model best practices to the Competencies Framework 5. Assess the trends and directions for future updating of the Reference Model |

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| **Description of work**  **Task 6.1. Fact Finding- Ecosystem of Knowledge Input WP2**  The ecosystem of knowledge to invite specific examples and reviews, from key industry defacto standards players and research groups defining new technological breaking ground work. We also have our internal stakeholders working at the coal face of this industry, the project partners with e-Infrastructure knowledge who can also contribute to develop the comprehensive list of examples.  **Task 6.2. The Reference Model**  To define and create the **Reference Model** that is an extension of **the Competencies Framework WP5** of a list of competencies, by adding the corresponding case studies and best practices. This involves gaining a knowledge of the corresponding technologies and an example of it in its ‘best practice’ format, see below. The specification from the Call says to create a **Reference Model** which defines their competencies, supported by case studies and best practices relating to:   * e-infrastructures skills * human resources management, * support tools * related institutional practices.   **The Reference Model:** This Work Package defines the Reference Model as a framework of case studies that have corresponding ‘best practices’ and a prototype will be created to demonstrate the technological requirement of competency.   |  |  |  | | --- | --- | --- | | **Data Scientist** | Case Studies - grade – I | Best practices support tools | | **Big Data Network Programmers** | Case Studies- grade – II | Best practices support tools | | **Cloud Computing/Web Analytics** | Case Studies– etc. | Best practices support tools | | **Etc.** | Etc. | Etc. |   **Task 6.3. The User Guide for the Reference Model**  Design a User Trial and User Guide for the Reference Model with the Competencies Framework that relate to the e-infrastructure skills and human resources. The models are used for levels of determination for the resolution of roles determining the grade of e-infrastructure professional. Document and use the results of the trial to design the Reference Model better according to the related institutional practices in e-infrastructures and career development.  **Task 6.4. Profiling Tool Extension for the Reference Model**  Develop an extension software to the profiling tools and software assisting methodologies for Competencies Framework WP5 and competencies available with a software tool with menus and drill down selections. For example:<http://profiletool.ecompetences.eu/>  **Task 6.5. Human Resources Management and the Reference Model**  The **Reference Model** which defines their competencies, supported by case studies and best practices relating toe-infrastructures skills and it also needs a dedicated knowledge regarding how the model is in fact used, in terms of human resources management, and the profiling support tools for related institutional practices.  The task defines what the essence of this project that is defining a reference for competencies and skills that best describe these in a matrix of definitions. The competencies are then demonstrated by a case study or a prototype that describes how the particular skills levels and practices are found. These can then be used by human resources to determine the role and grade of career that the e-infrastructure worker has achieved. |

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| **Deliverables**  **D 6.1. Plan document to define the Reference Model Stakeholders (M06).** With sub-specialties **in e-infrastructure** technologies to define most career roles and profiles - note draws on D 6.1, D2.2 and D2.2 and D4.1.  **D 6.2. The Website –Ecosystem of knowledge – to display the current Competency Framework with the Reference Model**– a common framework with sub-specialties – Case studies and best practices and Prototyping for each area covered.  **D 6.3. Annual Report on The Reference Model (M12, M24, M35)** – a common framework with sub-specialties –description of Professional Career Structures and Grade Descriptions per year of the project.  **D6.4. The Final Results – Website with Competency Framework with the Reference Model integration (M12).** To show the use of the Reference Model and the Profiling tool and User Guide and HR supplements for the comprehensive set of e-infrastructure career definitions. |

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| **Work package number** | **7** | |  | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** |  | **Defining e-Infrastructure Professional Associations** | | | | | | | | | |
| **Participant number** | 1 | 2 | | **3** | | 5 | 8 | 9 | 10 | | 11 |
| **Short name of participant** | Cincis | BASSCOM | | **EUBA** | | CompletIT | PIN-SME | FPM | NAT UNI | | UNI OF HAIFA |
| **Person/months per participant:** | 1 | 2 | | **14** | | 5 | 2 | 1 | 2 | | 2 |

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| **Objectives**  When considering a distinct career for e-Infrastructure professionals, we wish to examine the possibilities of a dedicated Professional Association, and how it would facilitate the career for the staff working in this area. The roles of these professional associations can be defined as: "A group of people in a learned occupation who are entrusted with maintaining control or oversight of the legitimate practice of the occupation while also a body acting "to safeguard the public interest;"   1. To research how to establish an organization or set of organisations nationally and internationally, which represent the interest of the professional practitioners, and so act to maintain their own privileged and powerful position as a controlling body. 2. To collect inputs from stakeholders for PERITIA ecosystem of knowledge regarding the setting up of the national and international test professional association website, and recruit governing board 3. To **establish certification processes** from test professional association. Similarly to many professional bodies that are involved in the development and monitoring of professional educational programs, and the updating of skills, and thus perform professional Certification to indicate that a person possesses qualifications in the subject area. 4. To establish up-skills and further education processes from test Professional Association 5. To establish communications media from test Professional Association 6. To establish links to other Professional Associations from test Professional Association |

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| **Description of work**  **Task 7.1. The Professional Association website and Human Resources**  To collect inputs from stakeholders for PERITIA ecosystem of knowledge regarding the setting up of the national and international test professional association website, and recruit members suitable for a mock-up governing board to participate in the project, *note –CompletIT can undertake the software development of this website and maintain it with all its requirements.*  **Task 7.2. The Establishment of a Professional Association**  We will establish a template Professional Association at a National level and then another at an international level for the e-Infrastructure Personnel to create a test Professional Association at a National level at international level, to show how it can assist the establishment and promotion of this highly skilled profession.  **Task 7.3. The Professional Association website and the Compliance/ Reference Model**  The Professional Association test bed website can benefit member organisations and individuals by: Generating knowledge, and facilitating the exchange of helpful Profiling tools,   * Using the Competency Frameworks and guidelines to strengthen the work of member organisations * Using the Reference Model with the Competency Frameworks with examples of best practice   **Task 7.4. The Professional Association Website and Human Resources**  Supporting members in important areas such as Human Resources Career Development, the website will have a section  **Task 7.5. To Establish Certification for a Professional Association**  To establish certification processes from testsite Professional Association similar to many professional bodies involved in the development and monitoring of professional educational programs, and the updating of skills, and thus perform professional certification to indicate that a person possesses qualifications in the subject area.  **Task 7.6. To Establish Other Links in Website for a Professional Association**   * To establish up-skills and further education processes from test Professional Association * To establish communications media from test Professional Association * To establish links to other Professional Associations from test Professional Association   **Task 7.7. To Establish a Regular Conference for e-Infrastructure Professionals**  A regular European conference on e-infrastructure professionals will be established as a formal activity of the resulted professional body, and a website will be setup for the latest development in this field with dynamic information on latest technology, available training, jobs and career advice.  **Task 7.8. To Establish Ethics and Ethos of Professional Association**  How to establish an organization or set of organisations nationally and internationally which represent the interest of the professional practitioners, and so act to maintain their own privileged and powerful position as a controlling body. The association must balance of its wish to defend the interests of the public, while also wishing to defend the interests, status and privileges of the professional. Also how to address gender imbalance issues on the website.  This links to WP8, Societal Challenges and Social Inclusion. |

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| **Deliverables**  **D7.1 Website for Professional Association Testsite (M18)**. - test professional association website and recruit governing board  **D7.2 Report on how Establish Professional Association (M12).**For e-Infrastructure Personnel to create a template Professional Association at a National level at international level how it can assist the raising of the profile and promotion of this highly skilled profession.  **D7.3 Report on how Certification Processes from Professional Association (M18, M24)**. To establish communications media from test Professional Association  **D7.4 Report on how Other Profession Associations link to Professional Association (M18, M24, M35).** To establish links to other Professional Associations from test Professional Association  **D7.5 To Establish a Regular Conference for e-Infrastructure Professionals (M24, M35).** A regular European conference on e-infrastructure professionals, and a website will be setup.  **D7.6 Ethics Review Work Group (M24, M35).** The ethics review is a key part of the new Professional Association charters, Re: WP 2 and WP8: Societal Challenges and Policy. |

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| **Work package number** | **8** | | **Start Date or Starting Event** | | | |  | |
| **Work package title** | **E-Infrastructure Careers and Education** | | | | | | | |
| **Participant number** | 2 | 3 | | **4** | 7 | 10 | | 11 |
| **Short name of participant** | BASSCOM | EUBA | | **EUC** | DMU | NAT UNI | | UNI OF HAIFA |
| **Person/months per participant:** | 3 | 4 | | **10** | 11 | 6 | | 7 |

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| **Objectives**  The purpose of this work package is to address the educational issues that e-infrastructure creates and how Big Data is a new influence on our educational systems in general. The strategic planning for national and EU e-Infrastructure development [[5]](#footnote-5) stresses the need for qualified staff to be made available in order for research to be possible. The next generation of e-infrastructure needs not only to facilitate large scale analytics and modelling but also allow many new technologies such as using HPC and Cloud computing. Without an educational system to train highly skilled e-infrastructure technical staff, none of this is possible.   1. Review educational networks such as JANET (in UK ), HEANET (Ireland) and GEANT for PAN European education and research networks for e-Infrastructure 2. Determine an educational policy for national and international governing bodies to follow regarding:  * Schools – it is acknowledged by researchers in Education that topics of Big Data, Statistics and e-infrastructure will/should be included in school curriculum in the near future * Colleges and University – undergraduate – new curricula are being developed to match the new technologies under development from industry and skills such as Data Analysis * Graduate and Doctoral Training Units – combining the latest research with the new skills for e-infrastructure such as the latest techniques in high performance parallel computing.  1. Sponsor a stakeholder review of shorter courses for particular topics for ‘up-skilling’ – this is of use for staff who wish to remain current or up-to-date, or for employers who wish to retrain staff rather than find that they cannot source the staff with those skills in the marketplace. 2. Determine a mapping of qualifications and courses with the Competency Framework and Reference Model to achieve certification as indicated in work packages WP5, WP6.The results of these corresponding associations are then displayed on the test Professional Association website, to show how a career in e-Infrastructure can be achieved. 3. Determine a national and international programme for Lifelong Learning and involve all the stakeholders from the ecosystem of knowledge groups who are describing the competency and best case scenarios, and those who dictate future research and trends in the areas of e-infrastructure technologies. 4. Tackle issues of social inclusion, and in particular the need to address issues of gender, socioeconomic status, and disability status balance, - similarly to WP9, Deliverable 9.10. |

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| **Description of work**  Review of how these issues are/were addressed by other H2020 projects or by FP7 projects.  **Task 8.1** Review educational networks such as JANET (in UK), HEANET (Ireland) and GEANT for PAN European education and research networks for e-Infrastructure. This will include a review of how these issues are addressed by other FP7 projects such as PRACE, OSIRIS a project to guide ICT research infrastructures.  **Task 8.2** Determine an educational policy for national and international governing bodies to follow regarding schools and post-primary education for the future students of e-infrastructure,  **Task 8.2** Determine the Curricula and qualifications that colleges and Universities– undergraduate – new curricula are being developed and how these programs can match WP5, 6 for certification of e-infrastructure role definition.  **Task 8.3** What Graduate and Doctoral Training Units are required? A report on how to address the lack of doctorial programs and sufficient third level post graduate allocations for this career to be sufficiently sustained.  **Task8.3 Review of Training Modules for HR** – short courses for particular topics for ‘up-skilling’ – this is of use for staff who wish to remain current or up-to-date, or for employers who wish to retrain staff rather than find that they cannot source the staff with those skills in the marketplace.  **Task 8.4 Competency Framework and Reference Model – Education Certification** - to achieve certification as indicated in WP5 and WP6.The results of these corresponding associations are then displayed on the test Professional Association website, to show how a career in e-Infrastructure can be achieved.  **Task 8.5 Lifelong Learning – Continuous education – professional development- maintaining professional competencies -**Determine a national and international programme for Lifelong Learning and involve all the stakeholders from the ecosystem of knowledge groups who are describing the competency and best case scenarios, and those who dictate future research and trends in the areas of e-infrastructure technologies.  **Task 8. 6 Public-Private Partnership** associations for education – how industry and research work together to create educational modules and courses. This is very important as industry is out pacing research in certain fields.  **Task 8.7 Issues of social inclusion,** the need to address issues of gender, socioeconomic status, and disability status balance in particular, - similar to WP9.The emerging profession is markedly imbalanced in terms of gender and other groups, and it is the time to make an effort to address these shortfalls. |

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| **Deliverables**  **D8.1 Review Educational Networks** such as JANET (in UK), HEANET (Ireland) and GEANT for PAN European education and research networks for e-Infrastructure. **(M06)**  **D8.2 Review the Curricula of Education -** in e-infrastructure role definition for what are the Curricula and Qualifications that Colleges and Universities, undergraduate and post graduate, new curricula are being developed and how these programs can match WP5, 6.  **D8.3 What Graduate and Doctoral Training Units are required?(M18)**A report on how to address the lack of doctorial programs and sufficient third level post graduate allocations for this career to be sufficiently sustained for future requirements.  **D8.4 The Certification Processes Education Module (M12 – ongoing)** - in e-infrastructure role definition.- what are the Curricula and Qualifications that colleges and Universities? – undergraduate – and post graduate – and short courses - new curricula are being developed and how these programs can match WP5, 6. – this is an ongoing process of matching the educational requirements with best practices, etc.  **D8.5 Lifelong learning – Plan: (M18 – M30)** Using the website - establishment over 12 months test site in Professional Association website. |

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| **Work package number** | **9** | | **Start Date or Starting Event** | | | | |  | |
| **Work package title** | **SOCIETAL CHALLENGES and SOCIAL INCLUSION** | | | | | | | | |
| **Participant number** | 2 | **3** | | 4 | 11 |  |  | |  |
| **Short name of participant** | BASSCOM | **EUBA** | | EUC | UIN OF HAIFA |  |  | |  |
| **Person/months per participant:** | 1 | **18** | | 2 | 2 |  |  | |  |

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| **Objectives**  This work package seeks to address the societal issues that surround the e-Infrastructure profession how how the technologies of Data Science, and Big Data being handled and analysed, or stored present many interesting issues for debate and ethics. The impact on the economy was mentioned in section 2.2 Impact.  The societal dimension needs to be considered in the design of the career as a context for overall planning, as the grade level of the role definitions becomes more complex with areas where economic issues prevail. For example, we can include the e-infrastructure Reference Model best practices in the role of Business Analyst to cover the full extent of responsibilities of today’s financial expert with Big Data. Note - the responsibilities and code of ethics of the profession that is required is considerable, and so we define it an Ethics work group in WP 7.5.   1. What is the deal with Big Data? – e-Infrastructure profile in each member state   We will explore how the financial world is evolving around Big Data and how it impacts careers today and the state of play in each member state   1. Opportunities for Economic Policy –    1. How is Government Administrative Data Used? Review    2. Review of Private Sector Big Data 2. Research Literature Review – also includes reviews from see WP2 Task 2.2 3. Statistical Learning and Economic Research – see WP 8 4. How does Business Analysis and Economist use the State-of-The-Art competencies and best practice technologies – from the Reference Model – see WP6   Another issue addressed by this work package is that of social inclusion, the need to address issues of gender balance in particular, and to protect the rights of disability candidates. The e-infrastructure profession shows a considerable imbalance in female employees, and this issue needs to be considered, along with consideration for equality for all social groups.   1. Review on social inclusion issues and gender studies in particular 2. Communications on the ‘ecosystem of knowledge’ website for seminars and workshops 3. Gender Studies promotion study and communications initiatives |

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| **Description of work** (where appropriate, broken down into tasks), lead partner and role of participants  **Task 9.1Pan-European Review of e-Infrastructure per Nation**  Status of HPC labs, research programs and services in each member state, and report on collaborations between institutions to sustain academic and industrial research and development. The report will also review how the national grids link to each other in international federations, and their potential to deliver world class research, see European Strategy Forum on Research Infrastructures (ESFRA)[[6]](#footnote-6)  **Task 9.2 Opportunities for Economic Policy**   1. How is Government Administrative Data Used? Review and Analysis – (report every 12 months) 2. Review of Private Sector Big Data- report (every 12 months)   ***- use ecosystem of knowledge webinars and workshops/meetings/interviewsWP3***  **Task 9.3 Research Literature Review** – also includes reviews from see WP2 Task 2.2  Current research in the area of data management and computation, with a search in parallel with the other work packages reviews, to join up the results.  **Task 9.4 Statistical Learning and Economic Research** – (see WP 8)  Predictive modelling – econometric modelling and analysis, and risk analysis to be included in the Reference Model – case studies of ‘best practices’(ongoing)  **Task 9.5 How does Business Analysis and Economist** use the State-of-The-Art competencies and best practice technologies – **from the Reference Model**– see WP6  **Task 9.6 Big Data, e-Infrastructure Careers and Ethics (**see WP2 for Ethics work group)  As the demands of the career with responsibilities with large e-infrastructure and huge data sets are placing a need for a training in ethical standards to be built in to the new areas of learning fo staff. We have an ethics work group specially for this topic as it is a new and complex area to be addressed in the profession of e-infrastructure personnel.  **Task 9.7 Gender Studies –Why so few women working in the field of e-Infrastructure, and what can be done?**  **Task 9.8 Review reporting for social inclusion, racial profiling reviews – links to ethics workshops WP2**  Ecosystem of knowledge review of stakeholders and interviewing of participants. A compilation of studies can be put together over a two year period into the PERITIA project to create a final reviewing report after 20 months in the case of gender balancing, and 24 months for other social inclusion groups, to draw conclusions and issue recommendations regarding these sensitive issues.  **Task 9.9 Dissemination of Results** use two websites for ecosystem of knowledge competencies and best practice technologies – **from the Reference Model** – see WP6and test Professional Association website – to show ongoing results and ideas from work package. |

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| **Deliverables**  **D9.1** **Pan-European Review of e-Infrastructure per Nation (M06)**  D9.2 **Opportunities for Economic Policy** – Review and Analysis*– (report every 12 months)* (M12, M24, M35)  D9.3 **Review of Private Sector Big Data** –e-Infrastructure - report (every 12 months)(M12, M24, M35) links to D2.4 in Work Package 2.  D9.4 **Research Literature Review**- e-Infrastructure research directions (M09)links to Work Package 2- D2.4  D9.5 **Statistical Learning** and Economic Research to be included in the Reference Model – case studies of ‘best practices’(M12). (ongoing) links to WP8 Education - case studies of ‘best practices’  D9.6 How does **Business Analysis** and Economist use the State-of-The-Art competencies and best practice technologies – from the Reference Model(M12) (ongoing)  D9.7 **Annual Report** on Big Data, e-Infrastructure Careers and Ethics(see WP2 for Ethics work group) (M12, M24, M35)  D9.8 **Gender Studies Review**–Why so few women working in the field of e-Infrastructure, and what can be done?(M20)  D9.10 **Review for Social Inclusion and e-**Infrastructure - racial profiling reviews – links to ethics workshops WP2. (M24)  D 9.10 **Dissemination of Results** - use two websites for ecosystem of knowledge and test Professional Association website*– to show ongoing results and ideas*(M12) (ongoing) |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Work package number** | **10** | | **Start Date or Starting Event** | | | |  | |  | |
| **Work package title** |  | | **Dissemination and Exploitation, Communications** | | | | | | | |
| **Participant number** | 2 | 3 | | 4 | 6 | 7 | | 9 | | 10 |
| **Short name of participant** | BASSCOM | EUBA | | CIT DEV | CompletIT | DMU | | PIN-SME | | NAT UNI |
| **Person/months per participant:** | 2 | 3 | | 6 | 5 | 1 | | 3 | | 2 |

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| **Objectives**  There are a number of key stakeholders to communicate with the chief stakeholders and communicating with standards groups this depends on the consortia member PIN SME and University of Milan for the European standards group, BASSCOM on a national level in Bulgaria.  We will be communicating with industry leaders that are providing certification processes already, and using the two websites – the networking ecosystem website and the test bed website for a Professional Association to add information about careers and training courses, how to get recognition for work, etc.  PIN-SME and Sebastiano Toffalletti are iinvolved in WP10 on dissemination, and are to organise a final event in Brussels, this would give the project the final profile awareness it would benefit from: PERITIA_logo_1.jpg   1. Identify and segment the stakeholders and end users of the PERITIA project 2. Develop a Communication and Dissemination Plan describing how the project is to achieve its goals and specify the target groups for the communications work, this is linked to work in WP3. 3. Raising public and sector specific awareness of the project, its objectives and activities using the ecosystem of knowledge, as described in WP3with PERITIA networking events to be planned  * Discuss and identify potential collaboration opportunities * Assist in the promotion of the PERITIA results * Support networking opportunities and develop synergies between different initiatives  1. Set up effective dissemination tools and services for the project for transfer of knowledge for the project, this is in two parts  * ecosystem of knowledge website that disseminates the information as the project progresses * The website for test bed Professional Association and lobbying for this with potential groups – The Science Councils, Royal Academies, etc. * The final display on the website for the end results of a project  1. Facilitate and ensure effective communication and feedback with end-users and other stakeholders (see WP3) 2. Test and quality assure the Competency Framework and Reference Model – WP5 and WP6 and verify the user references with feedback from human resources groups 3. Promote the Competency Framework and Reference Model with standards groups nationally, in EU and globally, and with industry, to show its relevance and possible use. 4. Have a dedicated website for end results of the project that can be available for use to allow uptake and exploitation of our results for the definition of the e-Infrastructure Professional career. **The website will display the Competency Framework and Reference Model in its final state and all the references and feedback with all our links to the e-Infrastructure world of knowledge.** |

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| **Description of work**  In this light, and in order to promote the project activities and outcomes, PERITIA ecosystem of knowledge is to build a community of strategic stakeholders from all over Europe. Special attention will be paid on ensuring balanced representation from university e-infrastructure and industry and policy standards groups.  In particular the ecosystem community will include actors from both the industry and SMEs, and it will also, have stakeholders from policy bodies, EC representatives that will be invited to attend some of the networking events, press and media organizations, academic and research institutes, as well as related EU-funded projects, see WP3.  **Task 10.1. Develop a Communication and Dissemination Plan**  This plan will include the process of identifying the internal and external stakeholders from all the key players in industry, and research all NGO end users such as disability groups of the PERITIA project. This links to the work in WP1 and WP3, the Project Management and ecosystem of knowledge system we have for gathering all the views of all the stakeholders, and publishing the results of meetings and seminars as they take place.  **Task 10.2. Raising Public Awareness of the Project**  The dissemination activities planned in the PERITIA project aim at fostering collaboration opportunities and exchange of best cases among a large and varied group of stakeholders and players in the Cloud Computing and Big Data arenas, with specific focus on the Human Resources and Professional Body representation.  **Task 10.3. Publishing the Competency Framework and Reference Model**  At the core of our project is the adoption of the use of the Competency Framework and Reference Model to identify the competencies and professional ranking of the e-Infrastructure Careers. By establishing a list of the most common good practices, and by ranking the best performing aspects of the case studies and best practices, the Reference Model will be used widely and result in the creation of a list of “champions”, i.e. those institutions and promoters which perform dissemination very successfully.  **Task 10.4. Publishing the Profiling Tool for e-Infrastructure Careers**  The project findings will be presented as a catalogue contains the following sections: table of contents of tools presented, short description of tools, and demonstration of tools in practice through best practices. The catalogue will also be also available at the project website, a central repository of information about the projects, workshops and meetings of the PERITIA ecosystem knowledge base.  **Task 10.5. Test Professional Association Website**  Establishment of a test-bed website for the qualifications and e-infrastructure professional members recognised website. A dedicated website with the Professional Site for the centralised professional e-infrastructure qualifications and members recognition site.  Communications with the establishment of a website to represent the professional body of e-infrastructure professionals internationally and nationally, and its ability to award grades and roles and qualifications. To guide its delivery of services by our policy documents, and our Reference Model. To assist its ability to provide other general assistance to its members by our repository of reports, and ideas and websites.  **Task 10.6. Dedicated Website for End Results of the Project**  The final results of the PERITIA project will have a dedicated website for end results of the project that can be available for use to allow uptake and exploitation and engender future lively debate and dialog for the e-Infrastructure Professional career, with the Competency Framework and Reference Model and how it’s used, links to popular sites, links to ieee/ACM, etc. |

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| **Deliverables** (brief description and month of delivery)  **D10.1. Communication and Dissemination Plan (M12)**. To achieve its goals and specify the target groups for the communications work, this is linked to work in WP3.  **D10.2 Publish Survey of Career Trends (M18).** In the e-infrastructure industry and how it looks for the future.  **D10.3. Communication and Dissemination Plan (M18)**. Dissemination tools and services for the project for transfer of knowledge:   * ecosystem of knowledge website that disseminates the information as the project progresses * The website for test bed Professional Association and lobbying for this with potential groups – The Science Councils, Royal Academies, etc.   **D10.4. Final Website Results for the Competency Framework and Reference Model (M35).** To test and quality assure the Competency Framework and Reference Model –links with WP5 and WP6, to show its relevance and possible use, with toolkits for profiling and HR sources and links to Professional Associations and other popular websites.  **D10. 5. Report on Future networking opportunities and develop synergies for e-Infrastructure (M30).** Report from the project for transfer of knowledge from the project, ecosystem of knowledge website that disseminates the information as the project progresses.  **D10.6 Final Report on Project (M36)** |

**Table 3.1 b: List of work packages**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Work package No** | **Work Package Title** | **Lead Participant No** | **Lead Participant Short Name** | **Person-Months** | **Start Month** | **End month** |
| 1 | **Project Management** | 1 | Cincis | 30 | M01 | M36 |
| 2 | **A Review of the Current Policies, Standardisations in Europe** |  | Cincis | 10 | M04 | M24 |
| 3 | **Stakeholder theory and an Eco-system of Knowledge** | 3 | CIT DEV | 27 | M01 | M36 |
| 4 | **Review of ‘State-of-the-Art’ of Technologies** | 5 | DMU | 19 | M01 | M24 |
| 5 | **Defining the e-Infrastructure Professional Competencies Framework** | 6 | CompletIT | 23 | M06 | M34 |
| 6 | **A Reference Model : Implementation of the Case Study Set of Best Practices** | 8 | DMU | 30 | M06 | M36 |
| 7 | **Defining e-Infrastructure Professional Associations** | 7 | EUBA | 29 | M09 | M36 |
| 8 | **E-Infrastructure Careers and Education** | 9 | EUC | 30 | M01 | M36 |
| 9 | **SOCIETAL CHALLENGES and SOCIAL INCLUSION** | 7 | EUBA | 21 | M01 | M30 |
| 10 | **Dissemination and Exploitation, Communications** | 6 | CIT DEV | 20 | M24 | M3 |
|  |  |  | Total  Person/months | 239 |  |  |

**Table 3.1 c: List of Deliverables**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Deliverable (number)** | **Deliverable name** | **Work package number** | **Short name of lead participant** | **Type** | **Dissemination level** | **Delivery date** |
| D1.1 | Introduction Report | WP1 | Cincis | R | CO | M02 |
| D1.2 | QA of Ecosystem Webpages | WP1 | Cincis | DEC | PUB | M03 |
| D1.3 | QA of Competencies/Ref Model/Prof Assoc | WP1, WP4, WP5,WP6,WP7 | Cincis | DEC | PUB | M09, M12 +(M12) |
| D1.4 | Ethical Review Work Group | WP1 | Cincis | R | CO | M12 |
| D1.5 | Consortium Meetings Reports | ALL | Cincis | R | CO | M02+(3mths) |
| D1.6 | Final Report | W1, ALL | Cincis | R | PUB | M035 |
| D2.1 | Review - policies and standards for qualifications | WP2 | Cincis | R | PUB | (M09) (M18) (M26) |
| D.2.2 | Review of Current Research | WP2 | Cincis | R | PUB | (M07) (M18) (M28) |
| D2.3 | Review of Industry | WP2 | Cincis | R | PUB | (M09) (M18) (M23) (M31) |
| D 3.1 | Survey of national and international stakeholders | WP3 | CIT DEV | R | CO | M06 |
| D 3.2 | Website for PERITIA ‘ecosystem of knowledge’ | WP3 | CIT DEV | DEC | PUB | M06 |
| D 3.3 | Plan for the Ecosystem, invitations to meetings, seminars and workshops | WP3 | CIT DEV | DEC | PUB | M06 |
| D 3.4 | Meetings results display on our ‘ecosystem of knowledge PERITIA website’ | WP3 | CIT DEV | DEC | PUB | M06 |
| D 3.5 | Dissemination website on completion of PERITIA project | WP3 | CIT DEV | DEC | PUB | M36 |
| D4.1 | Review of ‘State-of-the-Art’ | WP4 | DMU | R | PUB | M12 |
| D4.2 | Integration and QA of ‘State-of-the-Art’ | WP4 | DMU | DEC | CO | M12 |
| D5.1 | |  | | --- | | Questionnaire for the Competency Framework ( M06) | | WP5 | CompletIT | R | CO | M06 |
| D5.2 | Website Display of The Competency Framework (M12) | WP5 | CompletIT | DEC | PUB | M12 |
| D5.3 | Report on Progress of Competency Framework, Reference Model - (6 months) | WP5 | CompletIT | R | CO | M12+6MTHS |
| D5.4 | The Final Results – Website with Competency Framework with other parts. (M30) | WP5 | CompletIT | DEC | PUB | M30 |
| D6.1 | Plan of Reference Model Stakeholders – for ecosystem of knowledge | WP6 | DMU | R | CO | M06 |
| D6.2 | Website –Reference Model | WP6 | DMU | DEC | PUB | M18 |
| D6.3 | Annual Reference Model Report | WP6 | DMU | R | PUB | M12, M24 |
| D6.4 | Final report of reference model - impact statement | WP6 | DMU | R | PUB | M35 |
| D7.1 | |  | | --- | | Website - test Professional Association | | WP7 | UEBA | DEC | PUB | M12 |
| D7.2 | Report to Establish Professional Association | WP7 | UEBA | R | CO | M18 |
| D7.3 | Report for Certification Processes from Professional Association | WP7 | UEBA | R | PUB | M20 |
| D7.4 | Report on Links from Other Profession Associations | WP7 | UEBA | R | PUB | M20 |
| D7.5 | Ethics Review Work Group from Profession Associations | WP7 | UEBA | R | CO | M22 |
| D7.6 | Integration of Features for Professional Association and Final Report | WP7 | UEBA | R | PUB | M35 |
| D8.1 | Survey of stakeholders (MO6) | WP8 | EUC | DEC | PUB | M06 |
| D8.2 | Website for PERITIA ‘ecosystem of knowledge’ | WP8 | EUC | DEC | PUB | M10 |
| D8.3 | Plan for the Ecosystem, invitations to meetings, seminars and workshops | WP8 | EUC | DEC | PUB | M10 |
| D8.4 | Meetings results display on our ‘ecosystem of knowledge PERITIA website’ | WP8 | EUC | DEC | PUB | M09+3mths |
| D8.5 | Dissemination website on completion of PERITIA project | WP8 | EUC | DEC | PUB | M36 |
| D8.6 | Integration of Features for Professional Association and Final Report | WP8 | EUC | DEC | PUB | M36 |
| D9.1 | Survey of stakeholders for Societal Challenges and Social Inclusion | WP9 | EUBA | R | PUB | M06 |
| D9.2 | Website for PERITIA ‘ecosystem of knowledge’ | WP9 | EUBA | DEC | PUB | M10 |
| D9.3 | Plan for the Ecosystem, invitations to meetings, seminars and workshops | WP9 | EUBA | R | CO | M04 |
| D9.4 | Meetings and display on our ‘ecosystem of knowledge PERITIA website’ | WP9 | EUBA | DEC | PUB | M09 |
| D9.5 | Dissemination website on completion of PERITIA project | WP9 | EUBA | DEC | CO | M30 |
| D10.1 | Communication and Dissemination Plan | WP10 | CIT DEV | R | CO | M30 |
| D10.2 | Publish Survey of Career Trends | WP10 | CIT DEV | R | PUB | M18 |
| D10.3 | Final Website Results for the Competency Framework and Reference Model | WP10 | CIT DEV | DEC | PUB | M36 |
| D10.4 | Report on Future Networking and Synergies | WP10 | CIT DEV | R | PUB | M33 |
| D10.5 | Final Report on Project | WP10 | CIT DEV | R | PUB | M36 |

**KEY**

R: Document, report (excluding the periodic or final report)

DEC: Websites, patents filing, market studies, press & media actions, videos, etc.

OTHER: Software, technical diagram, etc.

**Dissemination level:**

Use one of the following codes:

**PU** = Public, fully open, e.g. web

**CO** = Confidential, restricted under conditions set out in Model Grant Agreement

**CI** = Classified, information as referred to in Commission Decision 2001/844/EC.

**Delivery date**

Measured in months from the project start date (month 1)

**Table 3.2 a: List of milestones**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Milestone number** | **Milestone name** | **Related work package(s)** | **Estimated date** | **Means of verification** |
| 1 | Reviews | WP2,WP4, WP8 | M06, M07, M09 | QA from WP1, review the reviewers |
| 2 | Review Congomerate | WP2,WP4, WP8 | M18 | QA from WP1, review the reviewers |
| 3 | Ecosystem | WP3, WP5 | M03 | Website up and running, QA testing of features |
| 4 | COMPETENCY Q | WP4, WP5 | M06 | QA review from stakeholders |
| 5 | WEB COMPETENCY | WP5, WP6, | M12 | Website up and running, QA testing of features |
| 6 | REF MODEL-1 | WP4, WP5, WP6 | M12 | Report on website up and running, QA testing of features |
| 7 | REF MODEL-2 | WP4, WP5, WP6 | M24 | Report on website up and running, QA testing of features |
| 8 | REF MODEL-3 | WP4, WP5, WP6 | M30 | Report on website up and running, QA testing of features |
| 9 | WEB COMPETENCY | WP5, WP6, WP7 | M12 | QA review from stakeholders from ecosystem |
| 10 | Certification | WP5, WP6, WP7 | M18 | QA review from stakeholders from ecosystem |
| 11 | EDUCATION | WP8 | M12 | QA from other partners/ecosystem stakeholders |
| 12 | LIFE-LONG | WP8 | M18 | QA from other partners/ecosystem stakeholders |
| 13 | SOCETIAL | WP9 | M12 | QA from other partners/ecosystem stakeholders |
| 14 | COMMUNICATION | WP10 | M24 | Report on website up and running, QA testing of features |
| 15 | WEB RESULTS | WP10 | M33 | Report on website up and running, QA testing of features |
| 16 | RESULTS | WP10 | M36 | Final Report on website, QA testing of features |

**KEY**

**Estimated date**

*Measured in months from the project start date (month 1)*

**Means of verification**

*Show how you will confirm that the milestone has been attained. Refer to indicators if appropriate. For example: a laboratory prototype that is ‘up and running’; software released and validated by a user group; field survey complete and data quality validated.*

**Table 3.2b: Critical risks for implementation**

|  |  |  |
| --- | --- | --- |
| **Description of risk** | **Work package(s) involved** | **Proposed risk-mitigation measures** |
| Quality Assurance issues for all aspects of the Project | ALL | **Cincis Ltd have extensive experience with all aspects of QA validation, and plan to check all reports and deliverables,** also the **e**stablishment of an Ecosystem of Knowledge Advisory Group **,** establishment of Technology Transfer Work Group for Competency Framework and Reference Model databases, and the establishment of Ethical Review Work Group will all work together to ensure that quality issues are handled immediately and the risks are assessed for future work. |
| Website software issues | WP3, WP5, WP6, W7, W10 | The Partners CitDEV and Indigovereg are very experienced website developers and are planning to develop the software to tailor to the requirements of the project, this is less risky than getting outside contractors as they can also maintain the websites for the duration of the project over the three years and provide a very professional service. |
| Data protection acts international | All WPs | The Ethical Review Work Group will be reviewing and assessing risk associated with data Management. |
| Difficulty with setting standards across EU/global from actors in ecosystem | WP4, WP5, WP6, WP9 | Involvement of all partners on different work packages as a team to get standards resolved |
| Budget considerations | WP3,WP5, WP6 | As above |
| Keeping up with developing standards and research input for e-Infrastucture best practices | WP2,WP4, WP6 | Having the ecosystem of knowledge interviewing of stakeholders to get the most up-to-date practices and review of research literature and defacto standards (WP2) |
| Failure of Competencies and Reference Model and Certification to integrate together in time to make project results coherent | WP5, WP6,WP7 | The planning of Deliverables and the links between work packages are designed to avoid this occurring and anticipate slippage |
| Failure of Education WP and Reference Model and Certification to integrate together in time to make project results coherent | WP5, WP6,WP8 | The planning of Deliverables and the links between work packages are designed to avoid this occurring and anticipate slippage |
| Final project results not communicating or networking to wide enough audience | WP3, WP10 | Final results on very professional website, a summer school of series of conferences for e- Infrastructure professionals, Social Media |

**Table 3.4a: Summary of staff effort**

We indicate the number of person/months over the whole duration of the planned work, for each work package, for each participant, and identify the work-package leader for each WP by showing the relevant person-month figure in bold.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **WP1** | **WP2** | **WP3** | **WP4** | **WP5** | **WP6** | **WP7** | **WP8** | **WP9** | **WP10** | **Total Person/ Months per**  **Participant** |
| **Cincis** | **22** | **6** |  | 2 |  | 3 | 1 |  |  |  | 36 |
| **BASSCOM** | 1 |  | 3 |  | 2 | 1 | 2 | 3 | 1 | 2 | 15 |
| **EUBA** | 1 | 2 | 2 | 2 | 4 | 2 | **14** | 4 | **16** | 3 | 50 |
| **CitDEV** | 1 | 2 | **9** |  |  |  |  |  |  | **10** | 22 |
| **EUC** | 1 |  | 3 |  |  |  |  | **10** | 2 |  | 16 |
| **CompletIT** | 1 |  | 2 |  | **12** | 2 | 5 |  |  |  | 22 |
| **DMU** | 1 |  | 2 | **15** |  | **13** |  |  |  | 1 | 32 |
| **PIN-SME** |  |  |  |  | 2 | 2 | 2 |  |  | 3 | 9 |
| **FPM** |  |  | 1 |  | 3 | 1 | 1 |  |  |  | 6 |
| **NAT UNIVER** | 1 |  | 3 |  |  | 6 | 2 | 6 |  | 2 | 18 |
| **UNI OF HAIFA** | 1 |  | 2 |  |  |  | 2 | 7 | 2 |  | 14 |
| **Total Person/Months** | 30 | 10 | 27 | 19 | 23 | 30 | 29 | 30 | 21 | 20 | **239 Total Person /Months** |

**Table 3.4b ‘Other direct cost’ items (travel, equipment, infrastructure, goods and services, large research infrastructure)**

Please complete the table below for each participant if the sum of the costs for’ travel’, ‘equipment’, and ‘goods and services’ exceeds 15% of the personnel costs for that participant (according to the budget table in section 3 of the proposal administrative forms).

|  |  |  |
| --- | --- | --- |
| **CINCIS** | **Cost (€)** | **Justification** |
| **Travel** |  |  |
| **Equipment** | 2500 | Project management software and visualisation software for |
| **Other goods and services** |  | Managing and displaying the results of the project |
| **Total** | 2500 |  |

1. A Strategic Vision for E-Infrastructure (UK) [↑](#footnote-ref-1)
2. CEN Workshop on ICT Skills CWA 16624-2 [↑](#footnote-ref-2)
3. http://www.springboardcourses.ie/ [↑](#footnote-ref-3)
4. 3 report from IDC for EU in 2010 [↑](#footnote-ref-4)
5. A Strategic Vision for E-Infrastructure (UK) [↑](#footnote-ref-5)
6. ESFRI includes ICT facilities large scale computing centres [↑](#footnote-ref-6)