

VOTECH PROJECT PLAN

March 2005

Part-A : cover note

This is the top-level project plan. It consists of several parts :

- (A) This cover note.
- (B) Project Objectives.
- (C) Summary of Work Areas
- (D) A summary list of project deliverables.
- (E) A summary list of project milestones.
- (F) Preliminary expected staff effort matrix.
- (G) The initial budget plan.
- (H) Project Governance and Management.
- (I) The "description of work", which is Annex-I of the contract agreed with the EC.

Regardless of detailed internal planning, this project plan will remain fixed until the "Project Plan Revision", scheduled for eighteen months into the project. Note that everything here in this project plan is consistent with the formal "Description of Work" agreed with the EC - some of it is re-worded for clarity, and some additional material is added, but no contractual obligations are removed.

Part-B : Project Objectives

These are the official objectives declared to the EC :

1. **Top-level objective** : to complete all technical preparatory work necessary for the construction of the European Virtual Observatory.
2. To assess new technologies and study the feasibility of their incorporation in Euro-VO
3. To create designs of new infrastructure components based on those new technologies
4. To create designs of science user tools and datamining services
5. To develop trial versions of new infrastructure components, tools, and datamining services and to test them
6. To decide what new interoperability standards are required, and to contribute to those standards with international partners through the International Virtual Observatory Alliance (IVOA)
7. To liaise with the larger Euro-VO structure, gaining refreshed versions of science functionality and architecture, and feeding back component test results, designs, and trial components for demonstration suites.
8. To liaise with computer science, IT industry, and related applications projects in order to mesh with larger standards and to save work wherever possible

An additional goal of VOTECH is to assist other VObs projects and organisations which develop the VOTECH designs and trial code through to finished products.

Part-C : Task Summary

The task areas can be summarised as follows :

DS1 : Consortium management. The aim here is to provide the necessary administrative and financial support to the consortium, along with establishing an external presence, through web pages, seminars, workshops and so on. Web presence will be integrated into existing Euro-VO structures (<http://www.euro-vo.org>). A training programme will be organised utilising workshops and on-line materials (interactive work throughs, help, FAQs).

DS2 : Technical Project Management. This task will provide leadership, planning and technical integration for the project and is responsible for all external technical deliverables. It encompasses the roles of Project Manager, Project Scientist and Technical Manager. It also aims to facilitate technical cooperation and coordination amongst the partners, with common processes and standards, a core software repository, versioned software releases etc.

DS3 : New Infrastructure. This task aims at producing final designs of mature components, as well as assessments, designs, and trials of new components that don't fit into the major categories of DS4-6 below. In addition it has a responsibility for considering interoperability, integration and testing within the context of the overall Euro-VO architecture.

DS4 : New User Tools. This task will produce designs for new VO-compliant end-user tools, both from internally developed concepts, and from externally requested user requirements.

DS5 : Intelligent Resource Discovery. This task aims at undertaking a feasibility study for developing components based on emergent technologies in the areas of the semantic web and ontologies. On the assumption that these studies are successful, the project will proceed to trial implementations, and standards development.

DS6 : Data Exploration. This task will assess a range of datamining and visualisation algorithms and packages, with a view to assessing how they can be run as distributed services, how they can be made VObs-compliant, and how they can be extended to extremely large datasets. On the assumption that these studies are successful, the project will proceed to actual component designs, trial implementations and standards development.

Part-D : summary of contracted deliverables.

DS1-01	Project website (6m)
DS2-01	Project Plan (1m)
DS2-02	Revised Project Plan (18)
DS2-03	Science (Functionality) Framework Document (6)
DS2-04a	First Baseline software release (12m)
DS2-04b	Second Baseline software release (24m)
DS2-04c	Third Baseline software release (36m)
DS2-04d	Fourth Baseline software release (48m)
DS2-05	Euro-VO Reference Architecture (48m)
DS3-01	Infrastructure Study Report (15m)
DS3-02	First Infrastructure Prototype release to DS2 (24m)
DS3-03	Second Infrastructure Prototype release to DS2 (36m)
DS3-04	Third Infrastructure Prototype release to DS2 (48m)
DS4-01	User Tools Study Report (27m)
DS4-02	First User Tools Prototype release to DS2 (30m)
DS4-03	Second User Tools Prototype release to DS2 (36m)
DS4-04	Third User Tools Prototype release to DS2 (48m)
DS5-01	Resource Discovery Study Report (33m)
DS5-02	First Resource Discovery Prototype release to DS2 (30m)
DS5-03	Second Resource Discovery Prototype release to DS2 (36m)
DS5-04	Third Resource Discovery Prototype release to DS2 (48m)
DS6-01	Data Exploration Study Report (21m)
DS6-02	First Data Exploration Prototype release to DS2 (24m)
DS6-03	Second Data Exploration Prototype release to DS2 (36m)
DS6-04	Third Data Exploration Prototype release to DS2 (48m)

These are the deliverables as agreed with the EC. They can evolve by agreement, and are of course subject to interpretation. For example, DS2-05 has the Design Reference Architecture delivered at month-48; it is very likely we will actually issue a preliminary v1.0 at month-46, and a revised v1.1 at month-48.

Part-E : summary of contracted milestones.

+0 months		Kick-off Meeting
+1 months		TAP meeting 1
+1 months	DS2-01	Project Plan
+2 months		Cycle-1 plan
+5 months		TAP meeting 2
+6 months	DS1-01	Functioning project web site (DS1-01)
+6 months	DS2-03	Science Framework Document
+6 months		Cycle-2 plan
+11 months		TAP meeting 3
+11 months		Consortium + Board Meeting 1
+12 months		Cycle-3 plan
+12 months	DS2-04a	Baseline software release-1
+13 months		Demonstration event
+15 months	DS3-01	Infrastructure Study Report
+17 months		TAP meeting 4
+18 months	DS2-02	Revised Project Plan
+18 months		Cycle-4 plan
+21 months	DS6-01	Data Exploration Study Report
+23 months		TAP meeting 5
+23 months		Consortium + Board Meeting 2
+24 months		Cycle-5 plan
+24 months	DS3-02	DS3 Prototype releases to DS2
+24 months	DS6-02	DS6 Prototype releases to DS2
+24 months	DS2-04b	Baseline software release 2
+25 months		Demonstration event
+27 months	DS4-01	Tools Study Report
+29 months		TAP meeting 6
+30 months		Cycle-6 plan
+30 months	DS4-02	DS4 Prototype releases to DS2
+30 months	DS5-02	DS5 Prototype releases to DS2
+33 months	DS5-01	Resource Discovery Study Report
+35 months		TAP meeting 7
+35 months		Consortium +Board Meeting 3
+36 months		Cycle-7 plan
+36 months	DS4-03	DS4 Prototype releases to DS2
+36 months	DS3-03	DS3 Prototype releases to DS2
+36 months	DS5-03	DS5 Prototype releases to DS2
+36 months	DS6-03	DS6 Prototype releases to DS2
+36 months	DS2-04c	Baseline software release 3
+37 months		Demonstration event
+41 months		TAP meeting 8
+42 months		Cycle-8 plan
+47 months		Consortium +Board Meeting 4
+48 months	DS2-05	Euro-VO Reference Architecture
+48 months		Demonstration event
+48 months	DS3-04	DS3 Prototype releases to DS2
+48 months	DS4-04	DS4 Prototype releases to DS2
+48 months	DS5-04	DS5 Prototype releases to DS2
+48 months	DS6-04	DS6 Prototype releases to DS2
+48 months	DS2-04d	Baseline software release 4

Part-F : Effort distribution

The table below summarises the predicted distribution of EU-funded staff effort across DS areas and partners. The main entries are expected EU-funded staff effort. The numbers in brackets are the expected partner-contributed effort.

	UEDIN	ESO	LU	UCAM	CNRS	INAF	Total
DS1	54 (3)	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)	54 (18)
DS2	0 (0)	0 (0)	0 (36)	0 (18)	0 (0)	0 (0)	0 (54)
DS3	36 (36)	18 (18)	36 (36)	36 (0)	18 (18)	0 (0)	144 (108)
DS4	0 (0)	36 (36)	0 (0)	36 (0)	54 (18)	18 (18)	144(72)
DS5	0 (36)	18 (18)	36 (0)	0 (0)	18 (54)	18 (18)	90(126)
DS6	36 (0)	0 (0)	0 (36)	0 (36)	18 (18)	36 (36)	90(126)
total	126 (75)	72 (75)	72 (111)	72 (57)	108 (111)	72 (75)	522(504)

This table is the correct prediction of expected staff effort as at the release of the Project Plan (March 2005). Note that the description of work submitted has some errors in the declared expected staff months.

Part-G : budget summary

(1) ALLOCATED FUNDS

The table below summarises the finances allocated to each partner. These amounts can be varied at the annual reviews, but only with full Consortium Board agreement. The amounts are in euros. The column headings show the short name of each partner, followed by the cost model applied - AC=Additional Cost, FCF= Full Cost Flat, C23 = Clause 23 - some elements of the CDS work are routed through ULP, using additional cost, and other elements through CNRS, using FCF.

	EDI(AC)	ESO(FCF)	LU(AC)	CAM(AC)	CDS(C23)	INAF(FCF)	TOTAL
<i>Consortium management activities (DS1)</i>							
Direct Costs	164800	3200	3200	3200	3200	3200	180800
Indirect Costs	32960	640	640	640	640	640	36160
Eligible Costs	197760	3840	3840	3840	3840	3840	216960
Re-imbursement	197760	3840	3840	3840	3840	3840	216960
<i>Sum of specific activities (DS2-DS6)</i>							
Direct Costs	465000	702400	435000	420000	911000	724000	3657400
Indirect Costs	93000	140480	87000	84000	182200	144800	731480
Eligible Costs	558000	842880	522000	504000	1093200	868800	4388880
Re-imbursement	558000	421440	522000	504000	634800	434400	3074640
<i>All activities</i>							
Direct Costs	629800	705600	438200	423200	914200	727200	3838200
Indirect Costs	125960	141120	87640	84640	182840	145440	767640
Eligible Costs	755760	846720	525840	507840	1097040	872640	4605840
Re-imbursement	755760	425280	525840	507840	638640	438240	3291600

(2) BREAKDOWN BY DESIGN STUDY AND CATEGORY

The table below breaks down the predicted expenditure by DS area and by category - staff, equipment, and other costs. These have predicted using a standard model as explained below. The numbers are predicted direct cost, not including the standard overhead, and before the 50% is applied to FCF elements. (Note that all DS1 activities are claimed at 100% even for FCF partners).

	EDI(AC)	ESO(FCF)	LU(AC)	CAM(AC)	CDS(c23)	INAF(FCF)	TASK TOTAL
DS1							
personnel	154600	0	0	0	0	0	154600
equipt	0	0	0	0	0	0	0
travel	0	0	0	0	0	0	0
other	10200	3200	3200	3200	3200	3200	26200
total cost	164800	3200	3200	3200	3200	3200	180800
DS2							
personnel	0	0	0	0	0	0	0
equipt	5000	5000	5000	5000	5000	5000	30000
travel	0	6000	21000	21000	6000	6000	60000
other	0	0	0	0	0	0	0
total cost	5000	11000	26000	26000	11000	11000	90000
DS3							
personnel	192000	152850	192000	192000	147000	0	875850
equipt	5000	5000	5000	5000	5000	0	25000
travel	36000	15000	30000	15000	15000	0	111000
other	0	0	0	0	0	0	0
total cost	233000	172850	227000	212000	167000	0	1011850
DS4							
personnel	0	305700	0	147000	294000	192000	938700
equipt	0	10000	0	5000	10000	5000	30000
travel	0	30000	0	15000	30000	15000	90000
other	0	0	0	0	0	0	0
total cost	0	345700	0	167000	334000	212000	1058700
DS5							
personnel	0	152850	147000	0	192000	147000	638850
equipt	0	5000	5000	0	10000	5000	25000
travel	15000	15000	15000	0	30000	15000	90000
other	0	0	0	0	0	0	0
total cost	15000	172850	167000	0	232000	167000	753850
DS6							
personnel	192000	0	0	0	147000	294000	633000
equipt	5000	0	0	0	5000	10000	20000
travel	15000	0	15000	15000	15000	30000	90000
other	0	0	0	0	0	0	0
total cost	212000	0	15000	15000	167000	334000	743000

(3) EXPENDITURE FORECAST MODEL

The following notes summarise the model that was used to arrive at the predicted expenditure, and hence the funds requested from the EC. We have considerable flexibility in how to spend our funds, as long as our expenditure is actual, economic, and efficient (i.e. clearly to the benefit of the project goals). The actual pattern of expenditure may often turn out to be significantly different, but these notes act as a record of our original intentions.

3.1 Cost models used. The UK partners (Edinburgh (1), Leicester (3), and Cambridge (4)) all enter under the AC model. ESO(2), and INAF(6)) enter under the FCF model. CDS belongs to the Observatoire Astronomique de Strasbourg (Unité Mixte de Recherche 7550) which is a Joint Research Unit of the CNRS and of Université Louis Pasteur (ULP). The contractor is CNRS, which has mandate to represent ULP. To arrive at the requested re-imbursements, we used the FCF model for elements predicted to be routed through CNRS, and the AC model for elements predicted to be routed through ULP.

3.2 Types of cost. The predicted expenditure covers three main areas : staff salaries, personal computing equipment, and travel. Note that travel and personal equipment was calculated for *all* expected team members - i.e. both EC-funded and partner-funded staff. (When we actually make expenditures, we should probably check the rules on this).

3.3 Types of Staff. We expect to need a mixture of Developers and science PDRAs, but make no distinction in the calculations below. We assume a mixture of Junior and Senior Staff. DSI is also expected to employ half of a web developer and an administrator.

3.4 Staff cost rates. For AC partners (and the ULP elements of CDS), we assumed standard model salary costs of €49,000/year and €64,000/year for Junior and Senior staff respectively. (These are direct costs; including employer on-costs, but before applying the 20% overhead). For INAF, and for the CDS-CNRS elements entering under FCF, we simply assumed twice these rates (and claim half). For ESO, entering under FCF, we used their standard staff rate of €101,900 for all staff.

3.4 Equipment Costs. We budgeted personal equipment at €5000 per EU-funded staff member - this is a one-off project cost, not an annual cost.. We have also budgeted for one development server at each partner, costed at €5000.

3.5 Travel Costs. The forecast is based on the assumption that each team member will travel to another partner organisation on average five times per year. We budget these trips at €1000 each, assuming an average airfare of €500, and a five day trip with expenses at €100/day. Overall then we budget for €5000/yr/staff member. Note that under standard rules we cannot pay for travel outside the EU. Note that this allowance has been made for all project staff - both EU-funded and partner contributed staff, assuming the staff numbers in the tables in the next section.

(4) DETAILED BUDGET TABLES

Below are tables showing what we have assumed about how costs are distributed between partners and the various design studies. These tables are based on the cost justification in the original proposal, but with some updates and corrections. We do not expect to adhere to them precisely in our actual expenditure, but they are a good record of our original intentions. This is particularly true of the partner contributed effort, which is modelled here as whole bodies, but in practice will often be fractional contributions from many people. Note all the costs are three year costs.

DS1 : Consortium Management Activities. The main predicted expenditure is for general financial, administrative, web-based co-ordination, and PR support. We assume 50% of a *Secretary* at a salary of £12,997, an *Administrator* at £21,125, and a *Web Developer* £21,125, all calculated assumed on-costs of 25% and an exchange rate of 1.52. We have also budgeted for some general costs - cost of publication production, dissemination of information, running workshops etc, estimated at €3000/year. All the above funds will be held by the co-ordinator. However we have also budgeted a standard cost for at least one audit for each partner, at €3200. The predicted partner contributed time in DS1 is the estimated time of academic investigators.

Special Note : during contract negotiations, we discovered that Consortium Management activities should be charged at 100% even for FCF partners. When we corrected this however, our total request became larger than our allowed maximum. The solution was to make some more or less arbitrary cuts in DS1 - reducing general costs from 9000 to 7000, and reducing the salary budget total to a round number that gave roughly the right answer..

DS1 Organization	Partner-funded Personnel (months)	EU-funded Personnel (months)	Personnel cost (Euro)	other cost (kEURO)
Edin(AC)				
PI time	3	0	0	7000 gen.costs
Secretary	0	18	37041	3200 audit
Administrator	0	18	60177	
Web Developer	0	18	60177	
<i>Total</i>			<i>157395</i>	
<i>Adjusted Total</i>			<i>154600</i>	
Leic(AC)				
PI time	3	0	0	3200 audit
Cam(AC)				
PI time	3	0	0	3200 audit
France (FCF)				
PI time	3	0	0	3200 audit
ESO (FCF)				
PI time	3	0	0	3200 audit
INAF (FCF)				
PI time	3	0	0	3200 audit
TOTALS	18	54	154600	26200

DS2 : Technical Project Management. No EU-funded staff effort is in this package. (Originally an EU-funded senior developer was placed here, but during contract negotiation, we agreed to shift this effort to DS3) Rather, we expect all the effort in this package to be partner funded effort from UK partners, using senior staff shared with the AstroGrid project. In the original proposal this was 50% of a Project Scientist and a Technical Manager; during contract negotiations AstroGrid agreed to add 50% of a Project Manager. In addition to standard staff equipment and travel, this task budgets for a development server for each site, and a 2K/yr allowance for investigator travel. The value in brackets in the total column is after applying the FCF 50% re-imbursement rate.

Special note : In the budget breakdown spreadsheet sent to Brussels, the 6K for PI travel was missed out here, and put accidentally in DS3 instead. It is left that way for consistency with the information sent to Brussels.

DS2 Organization	Partner- Personnel (months)	EU-funded Personnel (months)	Personnel cost (kEuro)	Equipment cost (kEURO)	Travel cost (kEURO)
Edin (AC) PI travel development server	0 0	0 0	0 0	0 5	0 0
Leic (AC) co-I travel Technical manager Project manager development server	0 18 18 0	0 0 0 0	0 0 0 0	0 0 0 5	6 15
Cam (AC) co-I travel Project Scientist development server	0 18 0	0 0 0	0 0 0	0 0 5	6 15
France (FCF) co-I travel development server	0 0	0 0	0 0	0 5 x 50%	6 x 50% 0
ESO (FCF) co-I travel development server	0 0	0 0	0 0	0 5 x 50%	6 x 50% 0
INAF (FCF) co-I travel development server	0 0	0 0	0 0	0 5 x 50%	6 x 50% 0
TOTALS	54	0	0	30 (22.5)	60(51)

DS3 : New Infrastructure. Costings here are standard. The staff position in Edinburgh was originally in DS2 but was moved during contract negotiations.

Note here, and in the following tables an important difference between the way the AC and the FCF partners are modelled. For AC partners, we assume whole bodies for which the EU funding pays 100% of salary cost (eg 49K/yr); partner-effort is assumed to come from separate bodies funded by other routes. For FCF partners, we assume all project staff are paid half from EU and half from local sources; the re-imbursement is 50% of the EU-half, but at a larger full-cost rate (eg 98K/yr). (Dizzy ?) In practice, the fractions charged may follow a different pattern - this is just the model we use for budget prediction.

Special note : The 6K for PI travel should logically be in DS2, but for consistency with the spreadsheet sent to Brussels, is here instead ...

DS3 Organization	Partner Personnel (months)	EU-funded Personnel (months)	Personnel cost (kEuro)	Equipment cost (kEURO)	Travel cost (kEURO)
Edin (AC)					
PI travel	0	0	0	0	6
Senior Staff	0	36	192	5	15
Junior staff	36	0	0	0	15
Leic (AC)					
Senior Staff	0	36	192	5	15
Junior Staff	36	0	0	0	15
Cam (AC)					
Senior staff	0	36	192	5	15
France (FCF)					
Junior staff	0.5x36	0.5x36	147 x 50%	5 x 50%	15 x 50%
ESO (FCF)					
Junior staff	0.5 x 36	0.5 x 36	152.85 x 50%	5 x 50%	15 x 50%
INAF (FCF)	0	0	0	0	0
TOTALS	108	144	875.85 (725.925)	25(20)	111 (96)

DS4 : New User Tools. Costings here are standard.

DS4 Organization	Partner- Personnel (months)	EU-funded Personnel (months)	Personnel cost (kEuro)	Equipme nt cost (kEURO)	Travel cost (kEURO)
Edin (AC)	0	0	0	0	0
Leic (AC)	0	0	0	0	0
Cam (AC) Junior staff	0	36	147	5	15
France (mixed) Junior staff (FCF) Junior staff (AC)	0.5x36 0	0.5x36 36	147x50% 147	10x50%	30 x 50%
ESO (FCF) Senior staff Junior staff	0.5 x 36 0.5 x 36	0.5 x 36 0.5 x 36	152.85 x 50% 152.85 x 50%	5 x 50% 5 x 50%	15 x 50% 15 x 50%
INAF (FCF) Senior staff	0.5 x 36	0.5 x 36	192 x 50%	5 x 50%	15 x 50%
TOTALS	72	144	938.7 (616.35)	30 (17.5)	90 (52.5)

DS5 : Intelligent Resource Discovery. Once again, a team of six in total is assumed, three of which are requested here. France-VO will lead this area, and so a Senior developer is requested there.

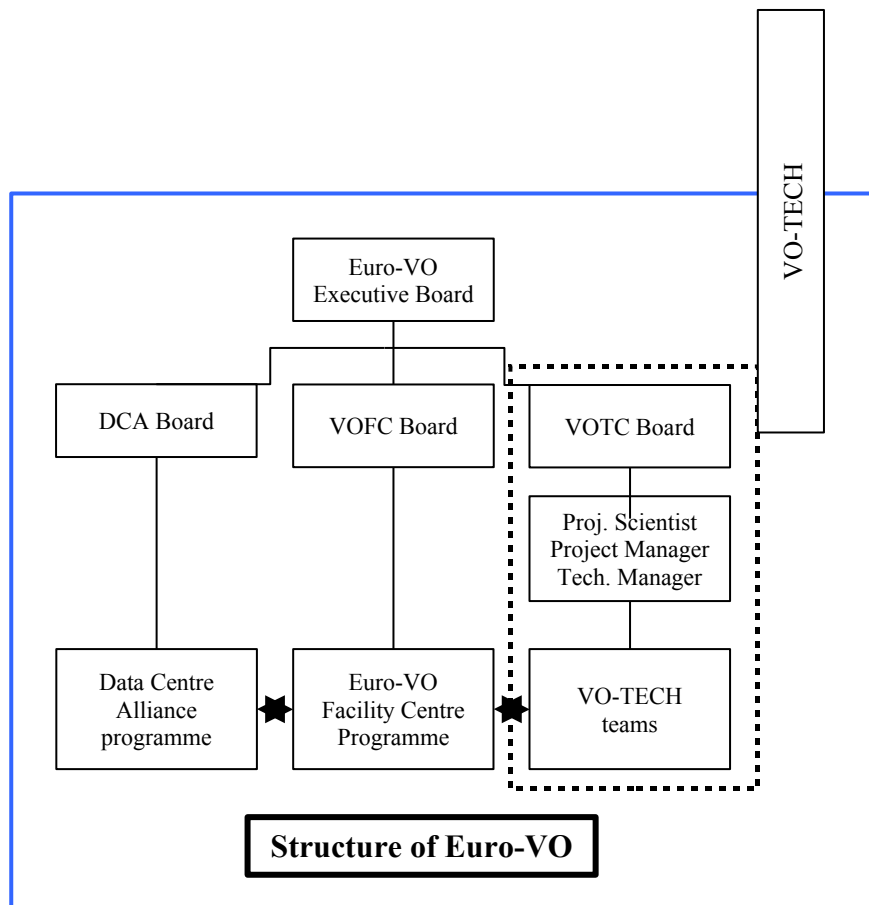
DS5 Organization	Partner- Personnel (months)	EU-funded Personnel (months)	Personnel cost (kEuro)	Equipment cost (kEURO)	Travel cost (kEURO)
Edin (AC) Junior staff	36	0	0	0	15
Leic (AC) Junior staff	0	36	147	5	15
Cam (AC)	0	0	0	0	0
France-VO Senior staff (FCF) Junior staff	0.5x36 36	0.5x36 0	192 x 50% 0	10 x 50%	30 x 50%
ESO (FCF) Junior staff	0.5 x 36	0.5 x 36	152.85 x 50%	5 x 50%	15 x 50%
INAF (FCF) Junior staff	0.5 x 36	0.5 x 36	147 x 50%	5 x 50%	15 x 50%
TOTALS	126	90	638.85(392.925)	25(15)	90(60)

DS6 : Data Exploration. Costings are standard here..

DS6 Organization	Partner- Personnel (months)	EU-funded Personnel (months)	Personnel cost (kEuro)	Equipment cost (kEURO)	Travel cost (kEURO)
Edin (AC) Senior staff	0	36	192	5	15
Leic (AC) Junior staff	36	0	0	0	15
Cam (AC) Junior staff	36	0	0	0	15
France-VO Junior staff (FCF)	0.5x36	0.5x36	147 x 50%	5 x 50%	15 x 50%
ESO (FCF)	0	0	0	0	0
INAF (FCF) Junior staff	0.5 x 72	0.5 x 72	294 x 50%	10 x 50%	30 x 50%
TOTALS	126	90	633 (412.5)	20 (12.5)	90(67.5)

Part-H : Governance and Management of VOTECH project

(1) Euro-VO context. The VO-TECH project fits within the larger Euro-VO programme, which contains three linked parts - the Data Centre Alliance (DCA), VO Facility Centre (VOFC), and VO Technology Centre (VOTC). Each of these activities is managed by its own Board, but the whole programme is overseen by a three person Euro-VO Executive Board (VO-EXEC). The VO-EXEC ensures that close liaison is kept between VOFC, DCA, and VOTC..VO-TECH is the first project of the VOTC.



(2) VO-TECH Project Co-ordination and Oversight

Project co-ordination will be undertaken by the University of Edinburgh, who will be responsible for all communication with the Commission on contractual matters. They will be responsible for processing payments to partners and will assist in compiling information required for completing cost statements.

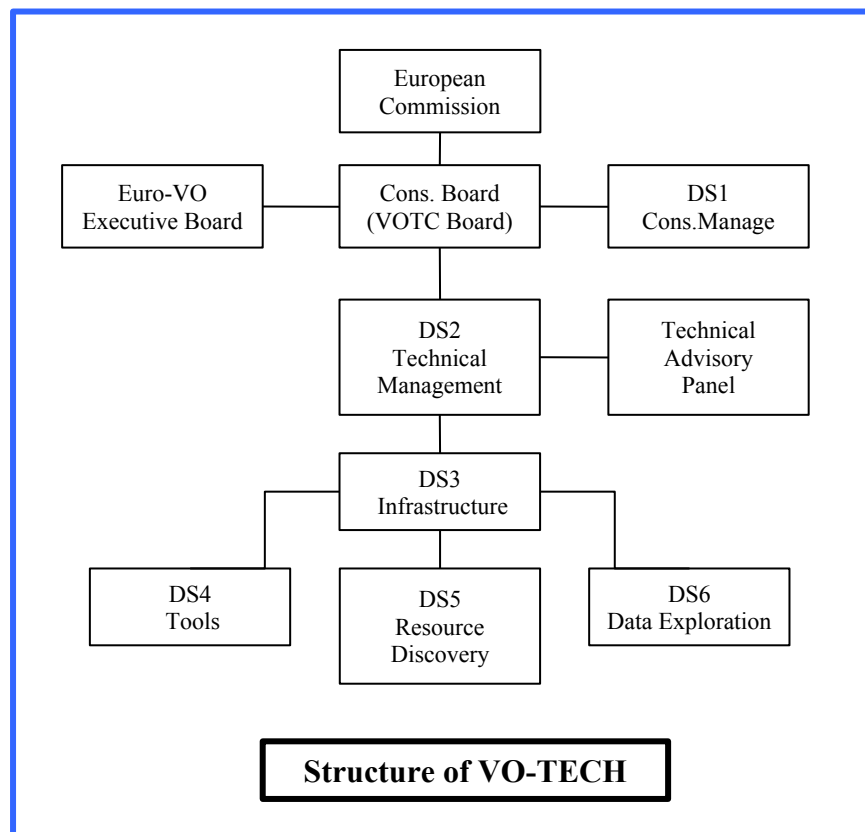
The **Consortium Board** is composed of the named investigators from each partner, supplemented by an administrative member if and when necessary. The Project Manager and Project Scientist attend the Board meetings. The purpose of the Consortium Board is oversight of the project - its setup, financial monitoring, resolution of issues between partners, and overall scientific and technical policy. The Board can authorise transfer of funds between partners when necessary. The full Consortium Board meets annually.

Consortium Board Members :

Edinburgh	Andy Lawrence
ESO	Peter Quinn
CDS	Francoise Genova
Leicester	Mike Watson
Cambridge	Richard McMahon
INAF	Fabio Pasian

In attendance :

Project Manager	Tony Linde
Project Scientist	Nic Walton



(2) VO-TECH Project Management.

Three key senior staff are responsible for planning and co-ordinating the VO-TECH programme : the *Project Scientist (PS)*, the *Project Manager (PM)*, and the *Technical Manager (TM)*. They will prepare long term work plans and budgets for VO-TECH, which will be revised every six months, with the assistance of the Technical Advisory Panel (TAP - see below). They report to the Consortium Board. The PM has overall

control of project systems. The PS has responsibility for gathering science requirements and analysing required functionality, and for liaising with the user community, the Data Centre Alliance, and external projects, e.g. EGEE, Planck, etc. The TM will lead coding standards and development processes for the whole VOTC programme, maintaining a code repository, code integration, and technical aspects of the project knowledge management system in conjunction with the co-ordinator. Finally the PM and TM will oversee and co-ordinate the sub-projects (see below). The project management team will work closely with the other components of Euro-VO and the user community, elucidating requirements and feeding back designs and trial components for integration into the final Euro-VO infrastructure.

(d) VO-TECH Programme Planning.

The project operates in distinct cycles known as Stages. After a short start-up Stage1, each stage will last six months. Project planning will be guided by the overall goals and milestones of the project plan, but fresh detailed plans will be drawn up for six months stage.

Responsibility for producing each Stage-plan rests with the Project Manager, but the plan is debated and approved by the *Technical Advisory Panel (TAP)*. This panel consists of the Project Manager, Project Scientist, Technical Manager, DS workgroup leaders, Board representative, and partner representatives. Under the guidance of the Project Manager, the DS workgroups develop plans which the workgroup leaders bring to a meeting of the TAP once every six months. The TAP also receives reports from the TM and PS, and from the partners. Using all these inputs, and guided by the overall Project Plan, the TAP approves a top-level plan for the following six month stage. This is then developed in more detail by the PM and TM.

Members of the TAP

Project Manager	Tony Linde
Project Scientist	Nic Walton
Technical Manager	Keith Noddle
Board Representative	Andy Lawrence
CDS Representative	Francoise Genova
INAF Representative	Fabio Pasian
ESO Representative	Paolo Padovani
AstroGrid Representative	Richard McMahon
DS3 Leader	Keith Noddle
DS4 Leader	Markus Dolensky
DS5 Leader	Sebastian Derriere
DS6 Leader	Bob Mann