PROPOSALS OF COMMON PROJECTS ON CULTURAL HERITAGE (CHINA – ITALY)

Proposal n. 1

1. Chinese-Italian Internet Portal

This common research proposal will exploit the experience obtained by Chinese and Italian scientists and technologists working on cultural heritage.

Up to now, the Italian counterpart developed a cluster of portals devoted to the EuroMediterranean basin and this experience will be useful for the new common activity.

It is well known that Europe invests a lot of human and financial resources in the Cultural Heritage science and technology sector at a national, regional, and communal level in respect to its GNP.

Investing intelligently means, above all, suggesting the right methodologies for analysing and restoring artefacts.

However, if research into diagnostics and restoration of Cultural Heritage is essential, not less essential is the need to communicate the results of these researches and distribute resulting products.

This is a common world problem: the safeguarding of Cultural Heritage does regard all nations and peoples because they represent the roots of our national identities.

The Portals developed by the Cultural Heritage Project of the National Research Council of Italy offer a unique opportunity to spread awareness of products and services in both Public Administration and private companies. It is also a reference in Europe for all those who, professionally or simply as citizens, have at heart the safeguarding of their own Cultural Heritage.

The actual architecture of the "***eachmed.com***" Portals is:

A – Local platforms

1 – National data entry nodes;

2 – National hub centre;

B – European platform

The Common European hub centre is located in Venice, Italy.

To improve the circulation of information, the Portals are accessible in thirty two languages: Albanese, Arabic, Bulgarian, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hebrew, Hungarian, Icelandic, Italian, Latin, Latvian, Lithuanian, Maltese, Norwegian, Polish, Portuguese, Rumanian, Russian, Spanish, Serbian, Slovenian, Slovak, Swedish and Turkish.

The actual cluster or bouquet of Portals is made of: **Eachmed-General** which contains general information on what is going on in this area all over the world. **Eachmed2- Documents** which contains written documents; **Eachmed3-Multimedia** which contains multimedia documents, particularly videos in streaming. Under construction are: **Eachmed4-Junior** which refers to the world of young people and **Eachmed5-Disable** which refers to the world of disabled persons.

During its first year of start up the Portal the visited pages were about 700,000; total visitors 19,000 about 50% from Italy, 22% from USA, 6% from China and 5% from Japan; for the moment, only the Italian section has been implemented.

2. Common Chinese-Italian research proposal:

The proposed steps are the following:

1 – to organize the architecture of the Internet Portal taking into account the contents of the information which will be put on line by exploiting the experience of the Chinese and

Italian experts on cultural heritage. In particular, Chinese and Italian experts will discuss the kind of research and technological development to be inserted inside the Portal.

2 - to suggest the software to be employed in developing the Portal taking into account that we need a tool which is easily employed by any kind of user from experts up to common people because the main goal of the Portal is to spread knowledge about Cultural Heritage scientific and technological activities in our countries.

3 – the Portal will be divided in five different sections or in a cluster of five different Portals which refer to different segments of population and interest: experts, young people, disabled people, etc.

4 – the Portal or the cluster of Portals will be in Chinese, Italian and English in order to allow the maximum possible diffusion all over the world.

5 – after the preparation and organization of the Chinese-Italian Portals they will start on Internet based in China and in Italy: as far as Italy is concerned the hub centre will be put in Venice.

3. Italian Partners

1. Organization name:
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2. Organization name:
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3. Organization name:
I.NET 2 (Internet provider)
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Arch. Vincenzo Sommella

4. Budget and Duration (Italian Partners)

	Budget (Euro)	Duration (months)
Definition phase:	50,000.00	6
Implementation phase:	50,000.00	6
Italian hub centre in Venice:	80,000.00	

Start Date: 01 October 2005

Prof. Angelo Guarino

Proposal n. 2

1. ArchaeoSurvey

The knowledge and monitoring of cultural heritage, both known archaeological sites as well as not yet discovered sites, are an absolute need in order to preserve them with adequate strategies; it is also extremely important their exploitation for social communities.

Traditional methodologies of investigation are limited by high costs and extended times needed to observe large areas on the ground. As a consequence there is a need to apply new methodologies which not only can discover new sites but also give a continuous monitoring.

Recently, telesurvey is being used by different methodologies: aerial pictures, particularly using historical pictures which can give a lot of information about the life of the discovered sites during the last century. Recently new methodologies come from the use of satellites and the information technology applied to the satellite pictures (multspectral analysis, data fusion, etc.).

The use of Cosmo SkyMed satellites which can operate with Synthetic Aperture Radar (SAR technology) may increase the details obtained by telesurvey to localise and monitorate archaeological sites: in particular they can penetrate vegetation and it is possible to use under any atmospheric conditions night and day.

It is also worth noting that satellite observation can be used together with other physical methodologies directly on the ground.

These activities create a huge amount of information of difficult accessibility because of different archives, platforms, acquisition methods, standards, type of data, etc. Because of the very long process to elaborate this set of information, unfortunately, most part of the archaeological investigations are unpublished and, if published, the dissemination is, more or less, related to the scientific community, with a minimum social impact and few perspectives of didactic communication. According to this premise we think that the construction of a spatial virtual reality system dedicated to the archaeological investigation can constitute the beginning of a new challenge for the archaeological methodology, passing directly from the fieldwork to the virtual reality, from the scientific domain to a collective communication, keeping all the data within the same interactive environment. This ambitious result can be obtained on the basis of a technological integrated approach collecting all the data in a VR system: GIS, remote sensed data, stratigraphies, monuments, structures, everything reconstructed and surveyed in 3D. In short, a VR platform collecting the data from the fieldwork (observable intra-site landscape) and, then, constructing the reconstructive hypotheses in real time according to the 3D models registered on site. All the 3D models could be linked with meta-data: SU (stratigraphical units), movies, drawings, pictures, DEMs, etc. In this way the users will be able to interact within the same immersive environment in real time and on low cost hardware platform (workstations or PCs with OpenGl graphic cards, 128-256 mb Vram). The digital environment reconstructed should include: the observed landscape, the classified landscape, the simulated landscape, the reconstructed landscape.

2. Common Chinese-Italian research proposal:

Based on previous research experiences carried out in China as well as Italy we propose:

1) ***Development of new and really up to date technologies for the use of satellites for identification and monitoring of archaeological sites and monuments on both nations. Extension of the use of these technologies to countries covered by satellites launched by Chinese and/or Italian space agencies.***
2) **Creation of specific software written in C++ based on OpenGl libraries (Virtools-DEV environment) and finalised to the 3D navigation, query, interaction of spatial data in real time. In comparison with the complexity of the software the interface will be easy and user friendly.**

3. Italian Partners

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4. Budget and Duration (Italian Partners)

	Budget (Euro)	Duration (months)
Definition phase:	100,000.00	12
Implementation phase:	100,000.00	12

Start Date: 01 October 2005

Proposal n. 3

1. Mural Paintings

The conservation of mural paintings is often a challenge: porous constituent materials, presence of soluble salts, polluted environments without climatic control make the conservation target extremely critical and any solution a difficult compromise among possible choices. This is particularly true for most of Chinese mural paintings because of the above general problems in addition to their very peculiar constitution.

The majority of the paintings are executed, in fact, on very unstable mineral substrata, such as clay and other earthen materials which are particularly sensitive to dampness, salts migration as well as climatic conditions.

The knowledge of the materic components and the description of their evolution and decay mechanisms at the molecular, nano- or micro-level, represents the necessary background for a correct conservation strategy, i.e. for the design of the most appropriate intervention procedures.

Several mineral based treatments have been developed, thoroughly studied in the laboratory, tested in situ and applied with success on numerous Italian and European mural paintings. The mineral character of these treatments generally assures more durable and compatible effects if compared with other methods based on synthetic polymers and other similar materials.

In the last years a great attention was dedicated to monitoring the decay progress of statues, decorated facades and bronze monuments. Monitoring both objects and treatments is the base for a successful conservation practice. The objective is to obtain data on the *progression of the deterioration.* We are not yet able to precisely quantify the deterioration progression on a case by case, context by context, material by material basis. This hinders the formulation of a list of priorities, prevents the optimal use of chronically scarce resources, and restricts timely intervention before reaching the 'point of no return' on truly urgent cases. Intervention is sometimes inevitable, but preventive conservation and programmed maintenance represent the target of the future conservation practice.

The conservation of the special mural paintings in China realized on earthen supports has been faced by several international groups in the past and presently.

They brought important contributions to the scientific studies of the painting techniques as well as on studying the state of conservation and monitoring the climatic condition.

Now it is time to dedicate a more important attention to the intervention, to find out appropriate treatments, to pre-test them on small areas and, in case of positive response, to apply them on extensive surfaces, before the degradation processes progress beyond an irreversible limit. Another increasingly crucial aspect, in the formulation of a targeted policy in conservation, is the accessibility of instrumentation and protocols for *monitoring the state of conservation* that are truly workable, rapid to use, easily applied on-site, and involve contained costs.

2. Common Chinese-Italian research proposal:

We suggest a common program offering our knowledge and expertise to the Chinese colleagues involved in the conservation program of their mural paintings, just to integrate their experience, to cooperate with them and with the other international teams to find the most appropriate and reliable solutions for restoring and preserving their unique patrimony.

The set up of appropriate diagnostic procedures together with intervention and preservation protocols, will be the final goal of the common efforts.

3. Italian Partners

1. Organization name:
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4. Budget and Duration (Italian Partners)

	Budget (Euro)	Duration (months)
Definition phase:	40,000.00	6
Implementation phase:	60,000.00	6
On site conservative tests	70,000.00	6
On site monitoring trials	70,000.00	6

Start Date: 01 October 2005

Prof. Angelo Guarino