

*Obiettivo 2 = Imprese*



**Innovation  
Relay Centre  
Network**

- Cultural Heritage -  
Catalogue of  
Technology Opportunities

## *Index*

Ref.	Title	Pag.
07 BE BIRC OIOO	3D visualisation for real estate and museum markets	1
07 IT LAUR OITC	Structural investigation of parchment and paper-made artefacts	2
07 CY CYIT OJOM	A location-based information system for cultural heritage content	3
07 IT MESP OJ6G	A high-quality, interactive, low-cost system for stereoscopic visualisation of 3D digital models	5
08 IT TUPR OJL7	Planar scanner for high-definition infrared reflectography	7
08 IT SUTC OJNU	Microwave disinfestations technology for conservation of paper and archival heritage	9
08 IT SUTC OJO1	Microwave disinfestations technology for conservation of the wooden cultural heritage	10
08 IT LAAP OJOQ	Detection of topographical features over wide areas using a shear-force microscope	11
08 IT TUPR OJSD	Fluorinated polymers for conservation and restoration of stone artefacts	13
08 IT TUPR OJSF	A Web GIS for the planning, managing and documenting of restoration works	15
08 IT TUPR OJSP	GSM audio guide for arts, tourism and environment	16
08 IT LOAS OJSZ	New Accessibility Tool for Cultural Heritage	18
08 IT SUTC OJTF	A geographically distributed system for aided recomposition of fragments	20
08 BE BIRC OJTI	Integrated System for Document Management	22
08 BE BIRC OJTK	Electronic Records Management System for administrative purposes in scientific and public organisations	23
08 IT TUPR OJUE	Platform for multi-schema cataloguing	24
08 IT TUPR OJUH	Photographic three-dimensional scanning till micrometric scale for cultural heritage monitoring	25
08 IT TUPR OJUO	Software application for description of historical archives	26
08 IT SUTC OJUP	Real-Time 3D platform for remote visiting of cultural heritage	28

08 IT TUPR OJV9	Multilayer painting analysis	29
08 FR FMCP OK5A	Expertise in evaluation and diagnosis in corrosion and conservation of metallic cultural heritage, either terrestrial or submarine	30
BICBA033	Learning Content Creation System	31
BICBA035	Online gaming & dating solutions	32
06 FR IFCP OFBO	Video game taking place in a medieval city	33
06 ES BCAV OFG2	Restoration system of three-dimensional art objects with lost parts	34
06 ES BCAV OFG4	Augmented Reality for the diffusion, promotion and learning of Cultural Heritage	35
06 HU HUTP OG07	Digitised Book Scanner	37
07 IT MESP OH9R	Wireless Information Network for Tourist and Environmental Routing	39
07 IT ONCA OIHC	3D laser scanner surveying and modeling	41
07 BE BIRC OIKQ	Paint stripping process to recover & restore original Art Nouveau wall paintings	42
07 BE BIRC OIKR	Restoration or re-crafting of golden lines of less than 2 millimetres in width, in original Art Nouveau decorative paintings	44
07 BE BIRC OIKT	Restoration of oil-based painted lines measuring less than 1.5 millimetres in width in original Art Nouveau buildings	45
06 ES BCAV OGFP	Know-how about shipping and packaging works of art, valuable and dangerous objects	46
06 IT MESP OGIM	Improvement of software for digital restoration of degraded texts using multi-spectral imaging	47

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## Abstract

**A Belgian real estate communication agency has developed a set of tools that blend art and technology to help real estate owners, architectural bureaus and large real estate developers achieve and maintain competitive advantage in their sector. This agency offers visualisation and communication solutions that allow selling at upstream level the real estate project before the construction phase starts. The company looks for a license agreement.**

## Description

A Belgian company, which is a privately owned creative studio, is part of a group of companies active in Web technologies, interactivity and 3D animation. The company, consisting of a team of 15 professionals, has developed specific competences for the real estate and museum markets.

These professionals use cutting-edge technologies to develop and deliver in a very short time high-definition images of a real estate project or a to-be museum or exhibition. An extremely good command of the use of global light effects allows getting realistically architectural images, with reliable visualisation - for example - of internal space for pieces of furniture to be chosen. The technological development covers the entire production chain, from the concept and the design of the project to the final 3D visuals (including videos and animations) for exteriors, interiors and historical reconstructions. The latter are of great added value for museums willing to valorise the cultural heritage they are responsible for and make it more easily accessible to visitors.

In order to complete the portfolio of services, this company also takes care of the communication issues for real estate agencies developing a dedicated Web site for each real estate project, the main function whereof is to comfort the clients while informing them. The additional service proposed is mapping the projects in 3D on Google Earth.

The above-described set of tools make real estate agencies able to compete with lively and animated images in order to help real estate owners, architectural bureaus and large real estate developers to visualise their idea and sell them to potential buyers.

The technology know-how offered is extremely fast and accurate, economically competitive and user-friendly. It actually allows a suitable application to a number of domains where the setting up of a 3D visual for further development and adaptation would involve a very expensive effort to the user in terms of time and economical, technological and human resources.

## Innovations and advantages of the offer

This technology offers a real estate broker the opportunity to swiftly communicate about a new project. A potential investor can use Google Earth to visualise a project, to assess the potential of its location and to decide upon an investment without leaving his chair.

## Current and Potential Domain of Application

Real estate owners, architectural bureaus and large real estate developers.

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## Abstract

**An Italian university research group has developed a new method for studying the preservation state of parchment and paper-made artefacts by Infrared Thermography and Electron Microscopy - in particular: analysis of the component materials, preservation state and degradation processes of the fibre microstructure related to the measured thermal properties variation. The partner should be either suppliers of artefacts or able to integrate the present method using other imaging diagnostics.**

## Description

The proposed method based on Infrared Thermography combined with Electron Microscopy provides a new non-destructive procedure for the quantitative assessment of the modern and historical parchment deterioration processes.

The analysis of the thermal diffusivity along specific directions represents a new tool to assess the impact of aging on parchment, which is proved to affect the thermal transport properties.

The method provides extended maps (thermograms) of the macroscopic defect distribution in a sample. Specific parts of the sample can be therefore pre-selected and, therein, the thermal diffusivity can be measured along different directions in the sample. This method can be also applied to other kind of fibrous structure (paper, wood, textile, etc.) where non-destructive evaluation would be required.

The method is based on two different configurations of infrared thermography: the heat pulse and the lock-in ones, where pulsed and periodic heating, respectively, is generated in the sample by light absorption. The induced temperature variation of the sample can be smaller than 1°C.

The application has been working for more than two

decades in the field of thermal properties and photothermal techniques.

## Innovations and advantages of the offer

The innovative aspects of the proposed method consist of:

- Having exploited the thermal transport properties measured along different sample directions as a new tool to quantitatively evaluate the deterioration processes in parchment.
- Having developed infrared thermography configurations to perform the above-mentioned measurements on parchment in a non-destructive fashion.
- Having combined results of Infrared Thermography with those of Electron Microscopy in order to correlate the behaviour of the thermal transport properties to the micro-scale damage evolution.

Advantages: the method is non-destructive and non-contact, providing depth-profile images of the buried structure. It is also relatively simple to adopt.

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## Abstract

**A Cyprus RTD SME with presence in Cyprus and Greece offers a location-based information system for cultural heritage content management in general. The system allows processing and presentation of content in real time based on the location of the visitor within the physical space. A commercial agreement with technical assistance or a license agreement partner is sought.**

## Description

A Cyprus research and development SME with presence in Cyprus and Greece offers a location-based information system for cultural heritage content management in general. Within the scope of the project, a software platform for handheld and mobile computing devices (known as Personal Digital Assistants: PDAs) was developed, which is employed by the visitors of cultural heritage sites or in a pre-selected area (i.e. mall, airport, exhibition, etc).

The system allows the process and the presentation of contact in real time based on the location of the visitor within the physical space, providing the following capabilities:

- Retrieval of multimedia exhibits.
- Interactive tours in the site, both predefined and free tours, with embedded audio, video and textual information.
- Retrieval of information in different levels according to the time that visitor has for touring within the physical space.

The system also includes:

- The realisation of both design and implementation study of the software and hardware architecture of the system, the detailed description of the tools and the different components that are needed as well as an installation study for the physical space.
- The realisation of a tour plan for the visitor, in order to obtain a complete set of information for the site that is being visited, thus ensuring the interactivity

between the user and the digital information provided and the seamless flow of information.

- Digitisation of the content according to the technical requirements posed by the requirements of the system's platform.

In the context of the specific project, client-server architecture was developed based on Java technology (J2ME) for mobile devices, which enabled the functionality of distributing multimedia content from the Server to the Clients of the system. The content was provided to the clients of the system based on the position of a specific client in space. The localisation of the client was determined through the utilisation of wireless network 802.11.g. The application is also compatible with Bluetooth and RFID technology.

The specific installation, which has been already successfully completed in the Pieridis Museum in Larnaka, is currently the first, at least at European level, which has fully integrated the use of Location Based Services in the context of cultural heritage. This innovative approach provided the Cyprus SME with the exact localisation of the client in 34 distinct locations within the physical area of the museum, with a precision varying from 0% to 0.3% position error, by utilising a set of 18 wireless antennas (including the redundant access points) and the same time providing simultaneously content to 4-5 clients (visitors).

## Innovations and advantages of the offer

- The main advantage of the system lies in the creation of new means of content management and especially in the presentation of cultural heritage content, incorporating an intuitive and personalised manner.
- The system can be used on a tailor-made basis and according to various parameters and different scenarios, i.e. targeting according to age, interests, available time and so on.
- Moreover, System can be used wherever a location



can be co-related with multimedia content, i.e. shopping malls, airports, fairs, etc. In such a case, advertisements, special offers or specialised content can be aired through the system's network and thus gain commercial added value.

- Content providers can take advantage of the technology's network in the pre-selected area and provide multimedia content through it in the same way as they do over the cellular networks (promoting games, tunes, images, photos, etc).
- Furthermore, a major advantage of the system is the possibility to be linked and communicate with other servers or systems (CRM, etc) in the pre-selected location, promoting thus important supportive information, i.e. showing prices, stock or date availability, different colours, etc. on a multimedia basis.
- Finally and most importantly, the technology's platform could also be used with the personal mobile phones of the visitors. Visitors will retrieve information in their mobiles, having exactly the same applications as in the PDA.

The system has been not only innovative in using existing technological capabilities, but also designed in such a way as to be fully scalable to cover further functional requirements that could be introduced in the future (if the need arises, like a navigator in a mall, in airports, exhibitions, etc.).

### Current and Potential Domain of Application

The specific installation, which has been already successfully completed in the Pieridis Museum in Larnaka, is currently the first, at least at European level, which has fully integrated the use of Location Based Services in the context of cultural heritage. This innovative approach can give information for

exact localisation of the client in 34 distinct locations within the physical area of the museum, with a precision varying from 0% to 0.3% position error, by utilising a set of 18 wireless antennas (including the redundant access points) and the same time providing simultaneously content to 4-5 clients (visitors).

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A high-quality, interactive, low-cost system for stereoscopic visualisation of 3D digital models (07 IT MESP 0J6G) 

## Abstract

**An Italian research group has developed a system for very high-quality stereoscopic visualisation of 3D digital models, where users can perceive the depth of a scene and interact with virtual objects. With a very competitive cost and a captivating design the installation is suitable for many different contexts (cultural heritage, training, marketing, scientific visualisation, etc.). Technical cooperation and commercial agreements with assistance for customisation and development are sought.**

## Description

An Italian research group, skilled in the fields of Augmented Reality (AR) and Virtual Reality (VR) technologies, has developed an interactive installation



for stereoscopic visualisation of 3D digital models.

With comparison to the systems already available on the market the device has a very competitive price and a higher quality of visualisation. The design is attractive, and colour, look and dimensions are fully customisable. This reveals to be useful in order to make the device perfectly suited to the place (museum, expo, hall, etc.) that hosts it.

The installation allows users to find themselves in a simulated environment in which they can perceive the depth of a scene, giving at the same time the possibility of interacting with the virtual objects in a very natural way.

The digital models are reconstructed with a very high degree of precision (~0,1 mm), thanks to advanced scanning technologies (3D laser and structured light scanners, high-definition cameras). The surface appearance is also very realistic without any trace of aliasing or other visual faults.

External and internal textures are extremely faithful to the original object, and the high level of detail allows the user to not percept any aliasing phenomenon even with the highest zoom factor.

The device may be sold with custom ready-to-use VR applications where the user can interact with the

virtual world in a very natural way. All the physical properties of the environment (e.g.: weight, friction, cinematic joints, etc.) can be simulated. The visual quality is improved by many innovative effects like dynamic shadows and reflections, smoke, and all the most recent CG (Computer Graphics) techniques.

The device was designed for the Cultural Heritage sector, but it can be used in many fields like design, medicine, training, marketing, etc.

In the Cultural Heritage field the device allows users to interact with the archaeological finds in a simulated environment, in which they can perceive the depth of the scene and observe each find from every point of view. This way to observe and study the finds overcomes the limits usually experienced in the museums, where the objects are protected by glass structures and visible only from few points of view.

Furthermore, custom software applications can be developed quickly to satisfy specific customers' needs.

Taking Cultural Heritage as an example, a replica of the museum halls could be created in order to simulate a realistic visit of the museum or to present artefacts contextually to the site of origin.

For marketing applications, the developers could create a 'product configurator' so the user can choose colour, look and accessories of the product he/she is willing to purchase, and see a virtual preview.

For design, applications can display a section of the product and modify the materials, lights and environment.

For scientific visualisation, for example in medical or geological fields, the device can be provided with dedicated applications that allow quick and efficient data exploration and manipulation.

The developers are looking for:

A high-quality, interactive, low-cost system for stereoscopic visualisation of 3D digital models (07 IT MESP 0J6G)



- Partners for technical cooperation (e.g. research centre of high-tech companies for further development).
- Partners for commercial agreements with assistance for customisation and development (e.g. museum, design centres, etc.).
- Partners for licensing.

### Innovations and advantages of the offer

Innovations and advantages:

- Very high quality of visualisation.
- Equipped with custom ready-to-use interactive VR applications.
- Very competitive price with comparison to existing systems.
- Attracting and customisable design (colours, look, dimensions can be modified according to customer needs).

### Current and Potential Domain of Application

The solutions can be employed in many market sectors like: automotive and industry in general, education, entertainment, cultural heritage, scientific visualisation, etc.

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## Abstract

**An Italian company specialised in optical non-invasive diagnostics services targeted at artworks has developed an actuated planar Infrared (IR) scanner, with sensitivity till 1700 nm, and a radiation source with rich continuous emission spectrum in the long wavelength range. The company is looking for partners and customers for technical cooperation.**

## Description

Infrared Reflectography is an imaging technique, mainly used in the fields of documentation and conservation of easel paintings.

IR reflectography is an a unobtrusive technique, which makes it specially suitable for the investigation of artworks. It generally makes underdrawing and underpainting visible (Underdrawing is the preparatory sketch that precedes the application of color paint).

This is because infrared light generally penetrates the upper layers and is then reflected by the ground and absorbed by the underdrawing. This differential absorption can be imaged by an infrared-sensitive camera.

IR reflectography is used by conservators and art-historians before the restoration work, and during any documentation phase.

Nowadays the traditional IR film has been mostly replaced by digital systems, which allow more reliable database creation, a better image processing and enhancing, easy reproducibility of the reflectograms, and, most important, a higher image quality, in particular as far as paint penetration goes.

The developed device consists of a motorised planar scanner equipped with an InGaAs (indium gallium arsenide) sensor. It can acquire high resolution digital reflectographies with high tonal dynamics. It features a light modular structure, with respect to the wide surface that can be acquired with one single scan (up to 6.5 sq.mt.). The acquisition is performed with a standardised procedure, implying the device prior lab

calibration, an on-site calibration, stable set-up, sensitivity, filter system and radiation source, whose characteristics are mentioned in the technical data. This will be provided together with the acquired and processed data.

Technical data:

- IR sensor: InGaAs Photodiode, spectral sensitivity 0.8 - 1.7 micron
- Lighting: 2 halogen lamps 10 W
- Spatial Resolution of Scanned Area 101,6 dpi (on painted surface)
- Reflectogram gray levels: 12 bit/pixel resolution
- Overall amplitude XYZ Area Analysis in a single acquisition: 1.8 x 3.8 m
- Modular and transportable device, easy to assemble
- Size: depending on the acquisition area chosen (in the actual prototype 200 or 400 x 230 cm; depth 70 cm)
- Light structure, easy to transport
- External stabilised power supply 24 V
- Computer controlled
- Proprietary software
- Average acquisition time: 1h30'/m2

## Innovations and advantages of the offer

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Technical data:

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- Light structure, easy to transport.
- External stabilised power supply 24 V.

- Computer-controlled.
- Proprietary software.
- Average acquisition time: 1h30'/m2.

### Current and Potential Domain of Application

Currently: art diagnostics; non-invasive survey of artworks, possibly in combination with other techniques.

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## Abstract

**An Italian SME with a twenty-year expertise in the field of electromagnetic energy applications has developed an innovative microwave technology for paper and archival heritage conservation. It is an effective and ecological alternative to the unsafe, polluting chemical methods currently used in the field of disinfestations and restoration. Companies for commercial/license agreements or public organisations for further development are sought.**

## Description

The current disinfestations methods involve the use of chemical agents, with significant effects of environmental pollution and of toxicity for operators, due to the presence of chemical residues in the treated objects.

An innovative, safer, microwave technology for disinfestations has been developed by an Italian SME having a twenty-year expertise in the field of electromagnetic energy applications.

It can be applied to paper and archival heritage conservation, with no risk for environment and operator safety.

Microwave disinfestations rely on the absorption of the electromagnetic energy of microwaves by water molecules contained in the pests infesting the objects under treatment, which is transformed into heat, leading to pests' mortality within a few minutes. In fact, most infesting biological agents (woodworms, moulds, etc.) do not survive over a certain temperature called lethal temperature, generally between 55°C and 60°C, which can be easily reached through microwave treatment.

The exact duration of treatment and the power required depend on the lethal temperature of the pests to be killed.

## Innovations and advantages of the offer

With comparison to the traditional disinfestations treatments, the proposed technology shows the following advantages:

- High efficacy of the disinfestations against all pests, whatever the life stage is.
- Rapidity (the treatment takes a few minutes).
- Safety for the operators.
- Greater energy-efficiency.
- Immediate availability of the object for use, soon after treatment (no toxic residues are produced during the treatment).
- Automation of the process.
- Compliance with the international environmental rules and with the requirements of the Montreal Protocol.
- Lower costs thanks to the process rapidity.

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Microwave disinfestations technology for conservation of the wooden cultural heritage

(08 IT SUTC 0J01)



## Abstract

**An Italian SME with a twenty-year expertise in the field of electromagnetic energy applications has developed an innovative microwave technology for disinfestations of wooden handiworks, antiques and furniture pieces. It is an effective and ecological alternative to the unsafe, polluting chemical methods currently used in the field of disinfestations and restoration. Companies for commercial/license agreements or public organisations for further development are sought.**

## Description

The current disinfestations methods involve the use of chemical agents, with significant effects of environmental pollution and of toxicity for operators, due to the presence of chemical residues in the treated objects.

An innovative, safer, microwave technology for disinfestations has been developed by an Italian SME having a twenty-year expertise in the field of electromagnetic energy applications.

It can be applied to wooden handiworks, antiques and furniture pieces, without risk for environment and operator safety.

The microwave disinfestations rely on the absorption of the electromagnetic energy of microwaves by water molecules contained in the pests infesting the objects under treatment, which is transformed into heat, leading to pests' mortality within a few minutes. In facts, most infesting biological agents (woodworms, moulds, etc.) do not survive over a certain temperature called lethal temperature, generally between 55°C and 60°C, which can be easily reached through microwave treatment.

The exact duration of treatment and the power required depend on the lethal temperature of the pests to be killed.

## Innovations and advantages of the offer

With comparison to the traditional disinfestations treatments, the proposed technology shows the following advantages:

- High efficacy of the disinfestations against all pests, whatever the life stage is.
- Rapidity (the treatment takes few minutes).
- Safety for the operators.
- Reduced risk of damaging the treated objects if proper protocols are followed.
- Greater energy efficiency.
- Immediate availability of the object for use, soon after treatment (no toxic residues are produced during the treatment).
- Automation of the process.
- Compliance with the international environmental rules and with the requirements of the Montreal Protocol.
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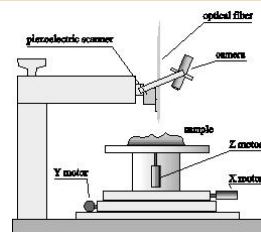
## Abstract

**An Italian university research group from Rome has developed in collaboration with an R&D institute a device for detecting topographical features of an almost flat surface of several square centimetres using a modified shear-force microscope. A prototype has already been tested successfully. The instrument can be used for several applications in the fields of cultural heritage, microelectronics, micromachining, etc. The research group is looking for a technical and commercial agreement.**

## Description

Getting the 3D topographic image of a surface is very important for:

- The measuring of surface roughness.
- The recognition of the form of traces left by tools used in manufacture of the surface.
- To highlight figures and shapes that are not recognisable with the naked eye.



The instrument necessary to get a topographic image of a surface is called profilometer. A profilometer is a measuring instrument for surface profiles, in order to quantify a surface's roughness. The vertical resolution is usually in the nanometre level, though lateral resolution is usually poorer.

Microscopic topographic measures are performed by very fine instruments such as Scanning Tunnelling (STM) Microscopes or Atomic Force Microscopes (AFM).

Large surfaces measures are performed by contact profilometer (a device similar to a phonograph, which measures a surface as the surface is moved relative to the contact profilometer's stylus) or optical profilometer (that is a non-contact method for providing much of the same information as a stylus-based profilometer).

An Italian university research group from Rome has developed a profilometer for large surfaces by modifying a shear-force microscope.

This instrument is composed of three DC precision motors that move the sample holder: two of them perform the surface scanning, and the third one performs the vertical motion. The latter is stopped

when the sensor tip experiences a sufficiently high shear force before touching the sample surface. The horizontal scanning is controlled by software either for scanning a microscopic surface with very high resolution or for scanning wide surfaces.

A prototype has been tested successfully. During the test the research group has observed images of a few square millimetres, the height whereof was 2 mm from the surface of the object scanner.

## Innovations and advantages of the offer

- 1) The instrument use the atomic shear-force sensitivity to bring the point of the instrument to the surface.
- 2) The instrument does not touch the surface like optical profilometers do.
- 3) For microscopic surfaces ( $\mu\text{m}^2$ ) the sensitivity of this instrument is less than 0.1 micron for vertical and horizontal resolution.
- 4) For large surfaces ( $\text{mm}^2$  or  $\text{cm}^2$ ) the vertical resolution is in the micron level.

The instrument offered here is very useful in the field of cultural heritage, where it's very important that every analysis of the object is done without destructive techniques.

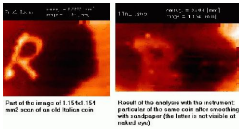
With respect to other topographical instruments, the device proposed has the advantage of i) scanning a wide area; ii) no contact between the surface and the device tip, iii) excellent vertical resolution; iv) very good lateral resolution.

## Current and Potential Domain of Application

The profilometer was designed to draw with nanometric precision a profile of a surface (plain) of an object with a size of several tens of  $\text{cm}^2$  in order to highlight almost disappeared traces from drawings or from corrosion, such as on coins.

Detection of topographical features over wide areas using a shear-force microscope

(08 IT LAAP 0J0Q)



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### Abstract

**An Italian research centre has developed different fluorinated and perfluorinated polymers to be used for the consolidation and protection of stone works of art. Thanks to the high energy of the C-F bond, these compounds show high chemical stability that makes them eligible products for the conservation and restoration of cultural heritage objects exposed to aggressive environment. The proponents look for technical collaboration with companies able to develop the synthesis to industrial level.**

### Description

The development of fluorinated polymers concerns the synthesis of different classes of compounds: perfluoropolyetheric amides and partially fluorinated (meta)acrylic polymers.

Perfluoropolyetheric amides are viscous liquid materials having high chemical stability and bearing polar groups capable of "fixing" them to polar substrate such as stone. Their properties make them eligible as protective agents for stone objects of relevant historical and artistic importance, in particular for those exposed to an aggressive environment.

Partially fluorinated (meta) acrylic polymers, on the other hand, in consequence of their suitable glass transition temperature, solubility in many organic solvents, water repellence, adhesive and cohesive properties may be considered good consolidants for porous decayed materials such as stone or wood artefacts. Among the different partially fluorinated (meta)acrylic polymers, the poly 2-fluoroacrylate show higher chemical stability and may be also proposed as protective agents for stone works of art.

An Italian research centre has developed and studied different fluorinated and perfluorinated polymers to be used for the consolidation and protection of stone works of art. Thanks to the high energy of the carbon-fluorine bond, these compounds show high chemical stability that, associated with their high hydrophobic

properties, makes them eligible products for the conservation and restoration of cultural heritage objects exposed to aggressive environment.

### Innovations and advantages of the offer

Innovation of the technology:

The conservation and restoration of works of art is usually performed with polymers or pre-polymers, supplied from the market for other uses and adapted for this specific application. The main characteristics of the involved products are water repellence capacity, and adhesive and cohesive properties that make them appreciated products for the consolidation and protection of indoor as well as outdoor stone artefacts.

One of the most important drawbacks of the currently used traditional compounds is their moderate or low chemical stability, which reduces the lifetime of the conservation treatments and often produces undesirable by-products. The low chemical stability is usually due to the low energy of the carbon-hydrogen (C-H) bond.

It is known that perfluorinated compounds, thanks to the high energy of the C-F bond, show high stability. However, they are not suitable for stone treatments because of their low affinity with these polar materials. Introduction of polar groups in the perfluorinated chain, or the substitution of specific hydrogen with fluorine in the molecule of traditional polymers, greatly improves the performance of the final products.

In the case of the perfluorinated compounds the presence of polar groups, such as the amidic ones, gives affinity with stone without losing the chemical stability of the original compounds. In the case of traditional polymers (acrylic polymers) the partial fluorination in the main chain improves the chemical stability, maintaining the appreciated properties of the non-fluorinated polymers.

Advantages of the technology:

The synthesis of specific compounds for the conservation and restoration of works of art puts at



the disposal of restorers and institution devoted to conservation of cultural heritage products with well-known and tested characteristics, and in particular with defined and desired properties. Moreover, the knowledge of the characteristics of the treatment products allows choosing the better solution for any case, avoiding undesirable or irreparable final results.

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## Abstract

**An Italian SME with strong expertise in developing software for cultural heritage has developed a Web GIS for the planning, managing and documenting of restoration works. It has been developed with standard technologies, aimed at planning the feasibility project of a restoration work and geo-referencing all the documentation, both geometric and alphanumeric, related to the work of art. The company is looking for final users, both private and public, interested in adopting the technology.**

## Description

The Web GIS has been developed with standard technologies aimed at planning the feasibility project of a restoration work and geo-referencing all the documentation, both geometric and alphanumeric, related to the work of art:

- Geometric data: vector representation of the work of art and of all the data that can be graphically visualised (such as areas of deterioration and the correspondent restoration works, stratigraphic structure of wall surfaces, etc.).

- Alphanumeric data:

- Technical information about the state of conservation and the restoration (chemical, physical, petrographic analyses; methodologies, materials and tools used during the work, etc.).

- Data contributing to in-depth knowledge of the work of art (general historical data, bibliography, archive documents, catalogue cards, etc.).

Thanks to this system the restorers and any person concerned with restoration works can map degradation or restoration areas over an exact and measurable model (iconometric model) of the work of art, and also geo-reference all the related technical and documentary data.

All the various data can be consulted through a transversal access, which allows making cross-referenced queries and statistics. The system allows

a comprehensive view of the degraded surfaces, of the works carried out and of the related information. It also enables to elaborate statistics and estimates, thus offering a valuable supporting tool for the economical and temporal plan of the works and the subsequent monitoring.

The system has a Web interface that can be accessed after inserting a user login and password: data entry and consultation take place by connecting to any Web browser without installing any software, and can also be made through wireless connection and mobile devices.

## Innovations and advantages of the offer

The system is intended to meet one of the major needs of people concerned with restoration activities (curators, restorers, conservators, operators, analysts, consultants, etc.) to have a unique tool to make an estimate of both costs and working time of a restoration work, to collect the historic and artistic data and the technical-scientific ones, and to monitor the state of conservation.

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## Abstract

**An Italian SME, with expertise in software for cultural heritage, has developed a Web tool for telephone services that allows to set up easily a wide range of interactive vocal applications usable by any kind of telephone, both land and mobile phone. It allows to easily develop an innovative audio guide service that does not require renting a dedicated tool but can be listened to directly on the mobile phone. The company is looking for final users interested in adopting this IT platform.**

## Description

In the field of cultural tourism marketing, an Italian company has developed an IT platform that allows to easily set up mobile based location services for any kind of telephone. Thanks to this platform it is possible to deliver to tourist's mobile phone both, for instance, cultural information written ex novo and entered in the CMS, and pre-existed information stored in the database and published on a Web site. It allows to easily develop an innovative audio guide service that does not require renting a dedicated tool but can be listened to directly on the mobile phone. All the information is always available everywhere and arrives directly to the tourist's mobile phone.

It is the best solution for territorial networks, open spaces and places where a point of access and exit is not available (e.g. open space museums, open air itineraries, museums networks, archaeological areas, historical centres, natural parks, etc.), where renting a traditional audio guide could be difficult, and to extend the services over the open hours of cultural facilities. The system integrates the best technologies for speech processing with technologies for VAS (Value Added Services) services management, providing the users with an Automated Response System. Contents are read by a high-quality synthetic voice that might be enriched by jingles and pre-recorded messages.

The user can interact with the application by dialling

the phone or typing on the PC. The system is developed to browse the vocal tree by the mobile phone: it allows the user to receive information and to interact with the application both by dialling and by natural voice.

The platform is available in 4 versions:

- Basic:

Classic audio-guide service available for any mobile phone.

- News:

It allows managing and sending promotional messages and news both in audio format and as SMS/MMS for fidelity purposes and marketing aims. The operator (i.e. hotel facility manager, vendor, events manager, museum manager, etc) enters the promo message in the CMS (Content Management System) and sets the delivering parameters, for instance as a vocal banner at the beginning or at the end of a story, or an SMS. The tool allows also delivering the message toward more recipients.

- Community:

Tool for community services and social networking management:

\* Voting: tool to set opinion polls to know the level of satisfaction of a service and to get back in real time the preferences and the public voting. The user calls and interacts with natural voice with the automatic vocal operator, which recognises and records the user vote and answers by the synthetic voice system. Moreover, the tool allows the user to vote by SMS.

\* Blog: module to publish user opinions about the visited places. The messages, entered in the system both by the Web and by SMS, can be both listened to and read.

\* Web Repository: it allows phone and Web integration: the user finds on the Web the itinerary that he listened to from the audio guide, and the user can download it both in pdf format comprehensive of



images, as an easily printing mini-guide, and in mp3 format.

#### - Tourist Pass:

It is an alternative system of traditional tourist cards that implements multi-channel e-booking and e-payment features, Web/mobile phone, to buy cumulative tickets and integrated tourist services (e.g. museums tickets, public transport, shows tickets, etc.).

It does not require POS, and it allows saving installation and maintenance costs. It guarantees the transaction control and it allows real-time statistics processing about the customs and tourists purchasing behaviours.

#### Innovations and advantages of the offer

This IT platform is an innovative product on the software market. Its special features are:

- Design & deploy: the user can develop his/her interactive vocal application by an on-line CMS. This means that it is not necessary to install either hardware (i.e. PBX - Private Branch Exchange) or a technical help.
- User-friendly: the WYSIWYG (What You See Is What You Get) editor allows creating the structure, commands, features and contents of a interactive vocal application without writing code.
- IT-Telecommunications convergence: it can manage database/Web/telephonic integrated services, as for instance data writing/reading on a database, action user tracking, etc.
- Quality: high-quality and multi-language (more than 15 languages) vocal synthesiser (TTS - Text To Speech) allows vocalising both information in real time and database queries results; the ASR (Automatic Speech Recognition) can recognise high-definition vocal commands.
- Customised and modulated: it is possible to choose among a set of standard tools that correspond to different features and services.

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### Abstract

**An innovative tool was developed by an integrated multidisciplinary Italian team of archaeologists and computer scientists, offering a high level of accessibility to the cultural heritage both for education and dissemination. Different and heterogeneous archives can be integrated without altering their internal structure. The team is looking for museums, public and private companies involved in the cultural heritage & computer fields in order to test & disseminate the applications of the system.**

### Description

The system allows bringing the single document from its original environment to the modern user's environment, filling the gap between the document and its interpretation.

The concept idea moves from the consideration that the study of cultural heritage is not a static subject: in fact research evolves through discovery of new documents and development of new theses by scholars. Therefore cultural heritage cannot be perceived anymore as a complex of single objects, storable in museums or collections, without links with the historical and social context. Cultural heritage value widens in space and time: it is under this point of view that it must be disseminated to the large public.

To date the interpretation of a document or a collection needed different heuristic passages usually carried out by scholars. Thanks to the offered methodology, such an opportunity of knowledge dissemination is extended to the large public. The process of research is thus clearly defined, so that the public can assess and interpret a document under different points of view.

At the root of this interpretation process a deep knowledge of all cultural aspects is needed. This semantic net relies on the bulk of documents and topics related to every specific cultural environment. These are put in connection through different

interpretation tools developed by scholars: in this way users are allowed to disclose information otherwise difficult to assess. Two communication media typologies have been defined: ontology and narrations.

The ontology promotes a common knowledge base that can be used by both archaeologists and computer scientists in order to provide a unique access point to heterogeneous data sources.

Narrations are tools to describe specific aspects of the cultural domain, in order to make information accessible. Items such as finding and monuments related to a narration are dynamically connected through the ontology. A narration plays the role of communication medium at different levels, both among archaeologists and towards the large public. Since narrations are retrieved from a scientific background produced by the examination of different scientific interpretations, the large public is able to assess and verify the disseminated contents.

The tool is mostly employed by the large public: through the net of narrations realised by experts, the user can choose his own cultural path, and therefore can approach a great number of objects or monuments scattered in different places of the world and now recorded into different archives.

### Innovations and advantages of the offer

Archaeologists and computer science experts have developed an innovative mind orientation within a proper cultural perspective. The tool is a conceptual architecture, context-oriented, open and participatory, where different actors cooperate to create and disseminate knowledge. A team of cultural operators was created as an environment in which every single background was preserved in order to exploit any tacit knowledge as working seed for creativity in cultural heritage handling.

This attitude allows to deal with cultural heritage, dynamically evolving over the time through the discovery of new documents and the development of new theories. The tool offers a set of services for

## New Accessibility Tool for Cultural Heritage

(08 IT LOAS 0JSZ)



different final users in the field of cultural heritage valorisation, involving dissemination and acquisition of knowledge.

For museums and collections, the following services will be offered in order to facilitate the valorisation of specific cultural compounds:

- Database development, archive integration in order to handle wider information.
- Collection integration within the semantic net through a narration system.
- Personalised Virtual Wings development for data presentation.
- New multidisciplinary extraction professional figures creation.

Adopting the system, organisations can insert their own cultural heritage in a semantic net (without modifying their own databases or allowing their access to all levels of users) and make it available for both experts and large public.

### Current and Potential Domain of Application

The tool offers a set of services available for different users in the field of cultural heritage valorisation, involving dissemination and acquisition of knowledge.

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## Abstract

**An Italian research centre has developed a geographically distributed system for the “aided virtual recomposition” of fragments of any type (paper, tissues, stones, etc.). It allows several people spread around the world to cooperate to the same recomposition through properly designed digital tools (enhanced man-machine interface, content-based image retrieval, etc.). The researchers are interested in manufacturing agreements with companies and technical cooperation with research organisations.**

## Description

An Italian research centre has developed a geographically distributed system for the “aided virtual recomposition” of fragments of any type (paper, tissues, stones, etc.). ‘Virtual’ because the work is done on digital images of fragments; ‘aided’ because it tries to exploit the contribution of both digital tools & restorers.

In fact, operators can bring their knowledge & experience to the recomposition process, and can extract from fragments semantic information beyond the capabilities of image analysis algorithms, but they are slow and not consistent in evaluating, classifying & describing the pictorial content of a huge number of images. Digital algorithms can instead extract only syntactical information from images (colour, texture, drawings, contours, etc.) but they can measure these characteristics very quickly & consistently.

Initially developed to recompose the 140.000 fragments of the Saint Mathew fresco painted by Cimabue, in the Upper Church of Saint Francis in Assisi, and broken during the earthquake in 1997, the system has been designed with two main objectives in mind:

- To transpose, as much as possible, and in a natural & effective way, the traditional recomposition process in a digital way. So, restorers can work on digital objects (preventing the real fragments from being damaged) and fully exploit their knowledge &

experience while being supported by the digital tools, without needing specific training in image processing or digital tools.

- To exploit the available images of the picture before the fragmentation, if available, while being able to provide significant help even without it, so becoming broadly useful in any recomposition problem.

The system includes a user interface the main components whereof have been inspired by their counterparts in the physical laboratory: the fragments, the table covered by the image of the fresco (if available) at a real-scale size, several boxes used to organise fragments logically related to each other. All these elements have a digital version inside the system, behaving mostly in the same way, which offers additional advantages:

- The fragment pictures, available in multiple instances, can be dynamically classified into several boxes, each one corresponding to a given visual property and simultaneously used by many restorers. Their retrieval is supported by an incremental & iterative query-by-example modality.
- The restorers can bring fragments into the workspace and move them around (through a special mouse with 6 degrees of freedom, allowing simultaneous rotation and translation) as long as the correct location is found.
- Several fragment features (colour, contrast, lightness, texture, etc.) can be manipulated through image processing techniques to enhance visual details.
- Fragments can be shown in half-transparency to better appreciate their position with respect to the background. The already placed fragments can be shown or removed to improve the visual perception of the space.
- The visual characteristics of the reference image can be changed dynamically, if needed.
- The scale of the display can be decreased to evaluate larger parts of the fresco (up to the whole picture if needed) or increased to enhance visual



details. A miniature image, showing the whole fresco at low resolution, enables easy navigation through the picture by naturally selecting the region of interest.

The system has been designed around a client-server architecture:

- The client application, running on a workstation with a Windows environment, includes the user interface and all the local processing needed for the re-composition.
- The server application, running on a multi-processor system with a Unix environment, manages the database and all the processing required to extract metadata from the huge amount of fragments, and to execute the queries on the basis of the examples provided by users.

### Innovations and advantages of the offer

The system represents a fully innovative solution to the fragments digital recomposition.

- It is not automatic: it aims at realising a synergy between the expertise & knowledge of operators and the efficiency & effectiveness of digital tools, making the recomposition easier & faster, however keeping the operator main responsible of the process.
- Operators do not need to be in the same place (where the physical fragments are): they can work virtually from anywhere in the world because only a very slow communication channel is needed between the workstation & the server, thus saving time & money.
- They can benefit from many digital tools (colour correction, image enhancement, support to fragment classification, search engine based on the image contents, etc.) that improve their efficiency.
- The characterisation of fragments is made by suitably designed image processing algorithms, ensuring a consistent & fast evaluation and organisation of the database.
- Fragments need not to be touched (they cannot be damaged). Even the heavy ones can be easily moved

and assembled.

### Current and Potential Domain of Application

The potential application range from cultural heritage (recomposition of paints, stones, textiles, etc.) to forensic (where fragments must be recomposed without touching them to save their chemical and physical value).

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## Abstract

**A Belgian non-profit organisation specialised in the area of document management has developed an integrated system for archival services, libraries and documentation centres. The company is now looking for any types of companies, small or large, including universities, for partnerships of joint further development, investment and/or licensing agreement for its unique software system.**

## Description

This software is an automated and integrated management system for archival services and documentation centres. It is the result of a four-year research project financed by the Belgian federal science policy.

This management system offers tools in managing archives, books, photos and manuscripts, and meets the descriptive requirements of different document types. It will soon be extended to oral archives, charts and museum objects.

The software allows content reproduction through the linking of electronic and digitised documents, including images.

This unique software is Web-based and independent from physical storage, client/server operating systems, client interface, and data structures.

## Innovations and advantages of the offer

The key concept to the approach is integration allows description and management of various documents (books, archives, stills) in very similar or identical software environments but still taking their specific needs into account. This enables seamless integration and simultaneous querying of the data and documents.

The company offers furthermore a global range of

services and expertise in document management including:

- Support in or execution the digitisation of document collections, starting with the creation of metadata to the scanning of the documents and presentation of both on the Web.
- Assistance in the description of collections along scientifically established lines.
- Specific training and consultancy support in the use of the software.
- Specific development of the software and specialised modules catered to the needs of the client.
- General training in the fields of document management, development consultancy.
- Hosting services and server maintenance.

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## Abstract

**A Belgian non-profit organisation specialised in the area of archive documentation and management has developed an electronic records management software tool that is specifically aimed at public and scientific organisations, but can include other types of organisations, too. The company is now looking for any types of companies, small or large, including universities, for partnerships of joint further development, investment and/or licensing agreement for its unique software application.**

## Description

This software application is the result of a five-year research project financed by the Belgian federal science policy. It follows the official international standard for Electronic Records Management System (ISO 15498) and ensures compliance with archival standards.

This software application gives support to basic administrative processes (mail management, process management, decision management, project management, redaction of reports, etc.) and manages the documents and files that are created during these processes (capture, versioning registration, description, filing, selection, appraisal, search and long-term archiving).

This unique software is Web-based and independent from physical storage, client/server operating systems, client interface, and data structures.

Since the software is intended for use in public organisations, development is based on Open Source solutions.

## Innovations and advantages of the offer

The document management approach provides all

functionalities to assure streamlined day-to-day production and management of electronic documents, and their archiving for future use.

Linked to this tool, the Belgian company behind it offers furthermore a global range of services and expertise in document management including:

- Specific training and consultancy support in the use of the software tool.
- Specific development of the software tool and specialised modules in line with the needs of the client.
- General training in the fields of document management, development consultancy.
- Hosting services and server maintenance.

## Current and Potential Domain of Application

- Support of various administrative processes by further development.
- Extension of the software tool to other types of documents.

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## Abstract

**An Italian company with deep experience in the development of technological systems for cultural heritage has developed a platform for multi-standard cataloguing and organisation of catalogue records. The system is a flexible multi-standard cataloguing platform, the main features whereof are its independence from any standard guidelines of cataloguing and its ability to self-configure its data-entry interfaces. The company is looking for final users interested in adopting the technology.**

## Description

The system is a flexible multi-standard cataloguing platform based on XML, the main features whereof are its independence from any standard guidelines of cataloguing and its ability to self-configure its data-entry interfaces according to the descriptive schema concerned.

It is composed of two integrated modules:

- Desktop version for multi-standard cataloguing.
- Web-based version for multi-standard cataloguing and consulting.

Both modules are independent from the cataloguing standards they are managing. They have been designed so that they can accept an XML description of any possible cataloguing standard, and to self-configure accordingly. Thanks to this solution, the system can easily manage custom or future versions of a cataloguing schema, without any direct customisation on the relational archive or the user interface.

Moreover, it is fully equipped, both in the desktop and in the Web-based versions, with import/export features following XML formats, thus enabling both on-line and off-line cataloguing in a central, shared, safe archive. It is built using Java technology, with the support of Ajax libraries. This approach allows using the Web interface without reloading the page at each

insert/modify operation on the data, thus greatly increasing the speed of data entry. The XHTML interface is conform to the W3C and WCAG (Web Content Accessibility Guidelines) standards.

## Innovations and advantages of the offer

The two modules are independent from the cataloguing standards they are managing. They have been designed so that they can accept an XML description of any possible cataloguing standard, and to self-configure accordingly. Thanks to this solution, the system can easily manage custom or future versions of a cataloguing schema, without any direct customisation on the relational archive or the user interface.

## Current and Potential Domain of Application

Potential final users are all the people concerned with the cataloguing of cultural heritage:

- Monuments and fine arts offices.
- Cataloguing and standardisation bodies.
- Cultural heritage, art trade and art appraisal organisations.
- Museums and galleries.
- Foundations.
- Public and private collections.

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Photographic three-dimensional scanning till micrometric scale for cultural heritage monitoring

(08 IT TUPR 0JUH)



## Abstract

**An Italian company has developed a system to generate a cloud point using digital camera. It is a 3D scanning method without using a laser scanner. Thanks to a sophisticated image analysis algorithm it is extremely efficient and accurate. RGB 3D model acquisition and computation are done using digital images only. The company is looking for partners for a commercial agreement with technical assistance.**

## Description

The system allows acquiring digital image triples through a calibrated reflex camera that scrolls on a precision-calibrated slider bar.

The system allows point cloud generation of objects represented into a triple image, without any control point or well-known measurements. The system is characterised by geometric and chromatic point cloud accuracy, and above all by its ease of use and by its components' hardiness.

It can be used in every application where there are no reflecting or chromatically flat (homogeneous) surfaces.

## Innovations and advantages of the offer

- It generates cloud points without laser scanner.
- Everybody can operate it with success; time and special skills saving thanks to a user-friendly interface.
- No other direct measurement needed on cultural heritage.
- No other instrument needed for metric survey.
- Easy to use and to carry everywhere.
- No electrical battery needed.
- High-quality 3D model with photographic fidelity colours.
- Extremely easy to use.
- Every model is obtained in 3 shoots only.
- Easy to move and great manageability of the instrument.

- Cheap.

## Current and Potential Domain of Application

Archaeology, architecture, cultural heritage documentation and monitor ring, restoration, high-resolution modelling, micro-modelling.

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### Abstract

**An Italian company has developed a software tool that helps archivists to describe, index & reorder documentary material of historical interest. It is an open system: XML/EAD standard is used for electronic coding of archival finding aids to ensure communication & exchange with other information systems or software & preservation in time of archival description in a format independent from specific software or hardware platforms used to produce it. A partner for technical cooperation is sought.**

### Description

The software tool has been thought for historical archives: it allows describing, indexing and reordering any kind of documentation with full international ISAD (International Standard Archival Description) and ISAAR (International Standard Archival Authority Record) standard compliance.

The software is distributed both in standalone and client-server version, allowing the same database to increase from different workstations, and managing access privileges in order to distinguish management and supervisor roles from compiler and indexer ones. It uses a totally original data model, fitting to different archival realities, remote and recent, public or private, so that user can establish multiple access ways to the same document and deal specifically with data concerning families, corporate bodies and places referred in the description.

It is fully compliant to the most recent standards such as ISAD(G) (General International Standard Archival Description) and ISAAR(CPF) (International Standard Archival Authority Record for Corporate Bodies) and uses an analytical yet flexible data model: strictly guiding the compiler but allowing to fit to the most different contexts.

It allows to perform every kind of intervention on the documentary material, from the most generic, such as the realisation of simple consistency finding aid, to the most sophisticated, such as the analytical inventory or the integral transcription of each document.

It uses powerful tools for rearranging and renumbering of series and archival units; it has extremely versatile print formats for provisory and definitive labels production.

It is an open system: XML/EAD (Encoded Archival Description) standard use for electronic coding of archival finding aids ensures communication and exchange with other information systems or software, and preservation in time of the archival description in a format absolutely independent from specific software or hardware platforms used to produce it. It is a multilingual software application: using the Unicode standard, it is able to manage descriptions using characters of all languages.

The software allows flexible complete management of high-resolution images linked to documentary material, being fully compliant with standards for acquisition, management and exchange of digital resources metadata.

### Innovations and advantages of the offer

- Use of XML/EAD for electronic coding of archival finding aids, ensuring communication and exchange with other information systems and preservation in time of the archival description.
- Adaptable and customisable interface, fitting to every screen resolution.
- Customisable data model rendering, allowing different depth level of interventions.
- Customisable level of compilation check to ensure uniformity between compilers.
- Use of the Unicode standard for multilingual data capability together with multilingual interface rendering for different native language users.
- Client-server version for multi-user contexts and load balancing.
- Integrated database appending capabilities via import for standalone uses in geographical distributed contexts or network unavailability.
- Minimum hardware and software requirements.
- Scalable and modular architecture.
- Multilingual interface and data management.



- Fully customisable vocabularies.
- Customisable and adaptable user interface, with great attention to user friendliness and powerful functionalities for every task to speed up common operations.
- Compliance with almost every DBMS (Database Management System), so that it is possible to use what the user already has or the free one distributed in the package.
- An all-in-one tool for every kind of archival work covering every step of the process, from organisation to compiling to publishing.
- Integrated image management and link with documentary material.
- Full text and contextual searches.
- Contextual help on line.

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## Abstract

**An Italian research institute has developed an advanced information platform able to represent the architectural morphology of the buildings under study with great accuracy at various scales, including both detailed elements and the monument as a whole, as well as the textural features of the internal and external surfaces. Every available piece of information is accessible in real-time 3D. The institute is interested in technical cooperation with companies or research organisations.**

## Description

An Italian research institute has developed an advanced navigation platform for the "virtual visit" of monuments. The main aim is to enable the public to enjoy the results of archaeological and archaeometric research, via the Web or stand-alone products, and to "virtually visit" monuments using real-time 3D visiting systems. The navigation platform allows the user to visualise complex scenes and DVR-based knowledge models in "full-screen mode" even on desktop computers. The current state of the monument is shown along with the previous phases in its history. All the textures have been obtained by processes of photo-modelling, and have been applied to the geometrical forms in accordance with the radiosity algorithm, with lights and shadows of the 'area' type. The result is extremely life-like, almost indistinguishable from the reality. The 3D platform uses integrated methods for the creation of three-dimensional models through laser scanning techniques, digital photogrammetry, 3D photo-modelling and direct surveying. It has been tested on Byzantine sites in the province of Lecce and in Basilicata, in the South of Italy, both as a stand-alone product and for Web applications. In the latter case further development is foreseen.

## Innovations and advantages of the offer

The navigation platform allows:

1. Exploitation of cultural heritage through an immersive system of visit.
2. Remote visiting.
3. Result extremely life-like.
4. Increase of tourist flows.

## Current and Potential Domain of Application

Marketing of cultural heritage.

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### Abstract

**An Italian company specialised in optical non-invasive diagnostics services targeted at artworks, has developed and patented a method to acquire separate images of varnish and paint layers that compose the external part of a painting. The company is looking for partners and customers to promote sales in other European countries.**

### Description

Painted surfaces are, generally speaking, multilayer structures. In the conservation field, a few methods are available to investigate such structures, and to permit access to image layers that are normally hidden to the naked eye. One of these methods makes use of IR (Infrared Spectroscopy) radiation. Analysing the IR radiation reflected by a painting's surface it is generally possible to see the underlying priming layer and possibly the preparatory underdrawing.

The other methods currently used to investigate the various separate layers involve micro-sampling of the painting surface and analysing the cross-section.

However, with these methods, there are two main drawbacks. The first one is linked to the need of a (micro-)invasive action; the other one is related to the fact that the results are valid only for that specific sample, and cannot be generally extended to the neighbouring surface.

The proposed method is intended to provide a qualitative image stratigraphy of the varnish and superficial paint layers, overcoming some of the previously mentioned weak points of the currently used techniques. This new procedure makes use of UV (Ultraviolet Visible) induced visible fluorescence multi-spectral imaging and exploits the fact that different materials fluoresce, reflect and absorb light in different ways, and electromagnetic radiation in the visible range has a different penetrating power depending on its wavelength. The result of this process is a set of images. In each of them a different layer is visible.

Technical data:

- CCD (Charge Coupled Device) cooled scientific camera.
- Interferential filter set.
- Computer-controlled.
- Proprietary software.
- Average acquisition time: 1h30'/m2.

### Innovations and advantages of the offer

The method enables the conservators to map the presence of different varnish layers and in paintings, and control the possible removal of them. This technique helps them in a new and powerful way in one of the most complex parts of a restoration intervention.

### Current and Potential Domain of Application

Art diagnostics; non-invasive survey of artworks, possibly in combination with other techniques.


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Expertise in evaluation and diagnosis in corrosion and conservation of metallic cultural heritage, either terrestrial or submarine (08 FR FMCP 0K5A) 

## Abstract

**A French company offers expertise in evaluation and diagnosis in corrosion problems of the metallic cultural heritage, either terrestrial or submarine. The company is looking for industrial or research partners to collaborate in a Mediterranean centre for conservation and restoration of underwater artefacts. A commercial agreement with technical assistance is also looked for.**

## Description

A French SME is specialised in evaluation and diagnosis in corrosion problems of the metallic cultural heritage, either terrestrial or submarine. The working fields are mostly harbour infrastructures, industrial heritage (metallic monuments) and submarine archaeology.

On the industrial heritage field, the company deals with on-site corrosion measurements, laboratory experiments, and provides some conservation recommendations. It is also specialised in on-site diagnosis or laboratory experiments (in collaboration with LERM - French Laboratory for Materials Study and Research) and especially in non-destructive testing.

The next axis of development will deal with the creation, in Arles, of a Mediterranean centre for conservation and restoration of underwater artefacts. This laboratory will work with European and moreover Euro-Mediterranean partners in order to develop some collaboration in the fields of:

- Corrosion evaluation: optimising on-site diagnosis tools and protocols.
- Conservation: developing on-site conservation treatments and optimising treatment times.
- Education: training archaeologists and young conservators.

## Innovations and advantages of the offer

The innovative aspects of this expertise lie in research results:

- Development of tools able to improve on-site diagnosis by means of non-destructive testing (acoustic emission, lamb waves, etc.).
- Development of a really innovative method to dechlorinate underwater archaeological artefacts: use of sub-critical fluids.

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## Abstract

**A Slovak company is looking for a partner that will help it to finish its Web-based Learning Content Creation System and finally bring it to the market. The product is fully developed, uses Macromedia Flash MX technology, and provides WYSIWYG authoring environment that is completely online. Developed courses are published as Flash MX applications and are SCORM & AICC compatible, so they can be included into most Learning Management Systems.**

## Description

Learning Content Creation System (LCCS) has been developed by a Slovak company with the use of Macromedia Flash MX technology, and provides WYSIWYG (What You See Is What You Get) authoring environment that is completely online. Developed courses are published as Flash MX applications, and are SCORM (Shareable Courseware Object Reference Model) & AICC (Automated Incoming Call Connection) compatible, so they can be included into most Learning Management Systems.

## Innovations and advantages of the offer

- Offers fully graphical WYSIWYG authoring environment superior to other Web-based LCCS systems
- Developed courses are platform independent (running on Windows, Linux, Mac OS, Pocket PC, Palm) and other operating systems supporting Flash MX
- Developed courses can be tested & published and distributed as offline or online Flash MX applications or included into any SCORM-compatible LMS (Learning Management Systems)
- It is accessible from any computer without need to install special software on that computer
- Can be distributed as ASP (active server page) or offline version - Both authoring and publishing is

completely online

- Platform-independent environment
- WYSIWYG Rich Internet authoring
- Compatible with AICC and SCORM standards

## Current and Potential Domain of Application

It can be used by providers of e-learning content, as well as companies that are using e-learning technologies in their business.

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## Abstract

**A Slovak company is an experienced developer and publisher of online entertainment technologies & services. Technologies are used in following type of projects: virtual casinos & casino networks, games management & competition systems, Internet multiplayer & single-player games, dating sites & portals, and Virtual Avatar chat sites. They are looking for partners who are interested in co-operating in the launching of online entertainment projects targeting a worldwide or local audience.**

## Description

A small Slovak software company is an experienced developer and publisher of online entertainment technologies & services. Their technologies are used in following type of projects:

- Virtual casinos & casino networks
- Games management & competition systems
- Internet multiplayer & single-player games
- Dating sites & portals
- Virtual Avatar chat sites

Their online gaming & entertainment technologies are built on a Linux/Unix core that provides high stability and scalability. Each of their technologies can be adjusted to the requirements of the project.

## Innovations and advantages of the offer

- Possibility to adjust the solution to the requirements of the partner
- Proven technology
- Designed to handle hundreds of concurrent users
- Built-in commercial model & payment methods

## Current and Potential Domain of Application

online portals,  
entertainment companies,  
TV stations,

radio stations,  
ISPs,  
games publishers,  
publishing houses.

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## Abstract

**A French company proposes a video game to immerse 7- to 12-year-old children in a typical medieval city, its streets and its historical monuments. It is looking for European partners to adapt, market and sell the product in their country.**

## Description

The video game allows 7- to 12-year-old children to immerse in a typical medieval city, its streets and historical monuments. The player becomes page, knight, cook, troubadour, etc. He mixes with those who work, those who pray, those who fight and discovers what life really was in the Middle Ages. It contains an integrated printable encyclopaedia (160 pages) filled with historically accurate data on the medieval period and 12 magnificent fictional scenes revived in collaboration with famous medievalists. It has been produced by a famous technical team (Centre of Higher Education on Medieval Civilisation).

## Innovations and advantages of the offer

The player is leading an investigation through Middle Age learning and having fun at the same time. The parents are glad to see their children spending time on their computer learning about History. The graphics are high-quality and the scientific background is more than serious. The children discover the cultural heritage, which is a physical and intellectual link between generations. This video game can offer much fun and knowledge at the same time.

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### Abstract

**The Conservation-Restoration Section of the Paintings Department of a Basque university in Spain offers a combined and reversible system of joint for art works with lost parts. The use of this system allows the reinstatement of the lost volumes in the art works that recover their original outer appearance without damaging or changing the structure. It can be used on a wide variety of art works. A commercial agreement with technical assistance is sought.**

### Description

The system is based on the use of micro-magnets of neodymium and ferrite with a high capacity of attraction and a minimum size (3-5 mm. diameters, 1-2 mm. high). The micro-magnets are stuck onto the reproduced detachable piece and the front of the area of the work where the lost part was located. The magnetic power of attraction keeps both parts together. The reproduced detachable pieces can be added to the art work without weakening its structure and can be also removed or changed with others with no problem. This allows the making of different detachable pieces and the use of the most convenient for the specific use of the work of art. Its utility relies on the next aspects:

1. It avoids the use of other conventional restoration systems of joint like glues, wooden or metallic sticks, screws and others that weaken and interfere with the structure of the art work.
2. It is non-damaging, stable and permanent.
3. It is reversible.
4. It admits detachable pieces with different external finishes.
5. It has a low cost and easy use.
6. It can be employed on a wide variety of art works.
7. It is respectful with the integrity of the work of art.

### Innovations and advantages of the offer

It is an original system in the conservation-restoration field. It differs from the conventional ones in that it

does not affect to the integrity of the work as it doesn't need either physical or mechanical reinforcements or the use of glues. The conventional systems employed until now do not allow the change of the reproduced parts in an easy and immediate way. On the other hand, with this new system the reproduced pieces can be changed and removed without any risk for the art work. Museums, art galleries, cultural centre and in general any institution related to the Cultural Heritage have to face many times the restoration and reinstatement of artistic works with lost parts. This system is efficient and cheap and in comparison to the ones used to the present time it implies an improvement in many aspects:

- Less time work and use costs as well as more stability for the art work.
- It also has the advantage of getting reproduced detachable pieces with different outer finishes; imitative-realistic, neutral, semi-realistic, and change or combine them depending on the location and the significance that want to express the work.

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## Abstract

**A Basque technological centre in Spain offers know-how and expertise in the use of Augmented Reality for Cultural Heritage applications. The technology provides a high degree of realism, due to the combination between reality and virtual information, and information that cannot be caught by the senses. Hence, Augmented Reality make cultural heritage more appealing for visitors. A company or institution is sought for technical cooperation and commercial agreement with technical assistance.**

## Description

In order to reach the cultural heritage as a resource, the maintenance of which is sustainable, the necessity arises to put in the value of the cultural resources. With this objective the necessity arises to develop methods, products, systems and tools that allow the citizen and the visitors to approach cultural heritage with the purpose of knowing it, to understand it and, thus, to value it. The use of new technologies in general, and Augmented Reality in particular, for the diffusion and conservation of cultural heritage opens a great number of possibilities to this sector. Augmented Reality is a novel technology, a variation of Virtual Reality, with which the main difference is that while in Virtual Reality the user submerges in a completely virtual world, Augmented Reality allows the user to see the real world augmented with virtual information. Real and virtual information coexist in the same space, allowing interaction with the environment, increasing the perception of the real world and providing information that the user cannot perceive by his senses.

Some of the potential applications of this technology applied to diffusion of the cultural heritage are: recreation of historical elements partially disappeared, presentation of evolution of aspect and uses of a building/environment during other phases of history, simulation of the restoration in situ of historical

buildings, virtual guidance, new exhibitions for interpretation centres, games, etc.

The technological centre has deep knowledge and a very long experience in Augmented Reality technologies and their application to different areas, and especially in the scopes of construction and cultural heritage. It has participated in projects of European, national and local scope, for application of these technologies during the past few years.

## Innovations and advantages of the offer

Some of the main innovating aspects of this technology for the creation of applications or tools for the diffusion of cultural heritage are the following ones:

- Dynamic and attractive presentation of the information, as a tool for improvement of the understanding of information.
  - Provides a high degree of realism, due to the combination between reality and virtual information.
  - Provides help for interpretation of the environment, including information that cannot be caught by the senses.
  - Approach to the patrimony to groups that traditionally are not interested in cultural heritage (children, adolescent, etc.), facilitating its approach in an interactive and fascinating way.
  - Eliminates barriers, like language, that the tourist traditionally finds when he arrives to a foreign country.
- The main advantage of Augmented Reality technologies applied to the diffusion and preservation of cultural heritage is in the capacity of applications that use these technologies to attract visitors to the tourist environment. In this way, an increase of the income generated by the proprietary resource is obtained. At the end cultural heritage will become an economic resource that acts as a tractor element of its region, instead of an economic load.

ELECTRONICS, IT AND TELECOMMS, ELECTRONICS, IT AND TELECOMMS

Technology Offer

Augmented Reality for the diffusion, promotion and learning of Cultural Heritage

(06 ES BCAV 0FG4)



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## Abstract

**A Hungarian SME has invented and patented a new digitised method of scanning books. Scanning is possible by the opening of books to a 45-degree angle only. There is no damage to the book's spine and distortion of pages is eliminated with this procedure. Luminosity and colour fidelity do not depend on outer light as the closed optical system provides direct and even exposure of the pages. The SME is looking for a partner to develop a prototype and later provide the manufacturing of scanners.**

## Description

A Hungarian SME has invented and patented a new digitised method of scanning books.

According to a market research more than one billion books are waiting to be digitised throughout the world. Because of increasing cost of storage and preservation of books, in the U.S.A. alone more than 117,000 libraries are planning to digitise their books. An additional advantage of digitisation is to make it possible for schools, colleges, universities, hospitals, etc. to have electronic access.

Processing the knowledge of the past 500 years stored in books means an enormous business opportunity. The importance of this is emphasised by the announcement of Google, Yahoo, Amazon and Microsoft that they intend to take part in varied international programmes in relation to digitising books.

The question is how to digitise huge quantities of books effectively while safeguarding the books, yet achieving good-quality reproduction.

The answer lies in the technical solution developed, protected by a patent comprising 10 claims. The preliminary survey report of the International Patent Association (PCT II.) acknowledged that these claims are novel, invent activities and can be used industrially.

All of the problems with book digitisation can be eliminated with the help of the Alexandria Book Scanner. The book digitisation process is based on the patented application as described in the patent claims, according to which scanning is possible by the opening of books to a 45-degree angle only. With the help of this, scanning of books can be realised without any damage to the book's spine, and distortion of pages is eliminated with this procedure.

## Innovations and advantages of the offer

Overcomes the following main problems of scanning:

- Defects in binding or spine arising from opening the book
- Uneven luminosity and colour fidelity depending on outer light
- Shadow or blind zones appearing at the spine
- Non-linear distortion appearing at the spine
- There are no defects at the spine as books are opened to a 45-degree angle only
- Luminosity and colour fidelity do not depend on outer light, as the closed optical system provides direct and even exposure of the pages
- There are no shadows or blind zones appearing at the spine as the optical system within the wedge shape illuminates and scans the centre of the pages to the same extent as the rest of the page.
- There is no distortion at the spine as the wedge shape optical system placed between the pages completely covers the pages of the book

## Current and Potential Domain of Application

Increasing cost of storage and preservation of books: in the U.S. alone more than 117,000 libraries are planning to digitise their books. As an additional advantage, it is making it possible for schools, universities, hospitals, etc to access books.



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## Abstract

**An Italian IT company presents a wireless tourist and environmental guide capable of delivering multimedia contents, geo-referenced maps, up-to-date information and targeted messages. The system integrates wireless technologies, global/local positioning (GPS, IrDA), and portable terminals (PDA) to support virtual and guided visits. The company is looking for partners, primarily associations and consortia, in tourism and commerce, for commercial agreements with technical assistance.**

## Description

The proposed system integrates advanced software and communication technologies and a robust architecture to implement a wireless tourist guidance system for indoor (historical buildings, museums, etc.) and outdoor (historic areas, archaeological sites, environmental parks, etc.) applications.

Through a PDA, the user (i.e., the tourist) has access to:

- Multimedia data (text, images, audio, video) describing a specific site/item of interest.
- Geo-referenced maps and related information (road networks, place of interest, position of monuments, restaurants, etc.).
- Up-to-date information about cultural events, emergency, "last minute" offers, etc.

It is important to notice that the information delivered can be opportunely tailored, according to user profiles, to select language as well as other parameters (time available, themes, main cultural interests, etc.).

The system supports two main mechanisms:

- Users may take their Virtual Visit by selecting and consulting the available multimedia information for all points of interests covered by the system.
- Users may follow a Guided Visit so that the system automatically delivers the information about the points of interest when the user is passing by.

Users may also identify their position, select the (type of) points of interests that must be visualised on the map, and ask for available information.

From a technological point of view, the system integrates multimedia information (text, images, audio, video), networking technologies (wireless, xDSL), global and local positioning (GPS, IrDA - Infrared Detection and Acquisition), and traditional and portable terminals (PDA).

A "client" application is loaded onto a PDA that is able to identify its position (through GPS for outdoor application or IrDA for indoor conditions) and, when the area is covered by wireless networking, to exchange information with a Central Repository where the information is classified, geo-referenced, translated and adapted to the different user profiles by using a specific application.

The Central Repository may also diffuse targeted messages provided by commercial or institutional clients, on the basis of the user's profile and position. PDAs can be made available at rental/distribution points, scattered around the area of interest (specific areas, cities, etc.), and the users may take advantages of its services all over the area.

The company is looking for partners commercially oriented, mainly in the tourism sector, and for associations/consortia interested to the promotion of cultural and environmental resources.

## Innovations and advantages of the offer

- State-of-the-art technologies:
  - Multimedia information (text, images, audio, video).
  - Networking technologies (wireless, xDSL).
  - Global and local positioning (GPS, IrDA).
  - Traditional and portable terminals (PDA).
- Multilingual support.
- User profiling to tailor the information delivered according to various parameters (time available, themes, main cultural interests, etc.).



- Possibility to deliver targeted information (emergency, commercial, etc.) for specified areas and users profiles.
- Unique device to cover wide areas with different types of information (cultural, recreational, etc.).

### Current and Potential Domain of Application

The system is very effective for culturally and/or environmentally rich areas.

The architecture based on a Central Repository that is able to deliver any kind of information and interact with the portable terminals (PDA) may also yield to new personalised services.

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## Abstract

**An Italian SME based in Turin has developed the surveying services that combine traditional techniques (GPS, total station, photogrammetry...) with 3D laser scanners (LIDAR technology). Laser scanning has highly effective applications in many fields, such as engineering, geology, architecture, cultural heritage. Laser scanning can be appreciably cheaper than traditional surveying techniques and much faster. The company is looking for technical co-operation as well as for project research partners.**

## Description

An Italian SME has developed the surveying services that combine traditional techniques (GPS, total station, photogrammetry...) with 3D laser scanners (LIDAR technology). Laser scanning has highly effective applications in many fields, such as engineering, geology, architecture, cultural heritage. The company provides a valuable support to studies and investigations designed to ascertain, modelling and document the geometric, morphological and dimensional characteristics of portions of the territory, objects, buildings, industrial plants, and civil works.

## Innovations and advantages of the offer

Laser scanners are used as surveying tools to produce detailed 3D renderings of complex morphological and topological realities. The technology provides us with the ability to obtain accurate as-built information on almost any surface or structure. The company uses data processing techniques to create 2D e 3D models by combining high-resolution digital images with the spatial data supplied by laser scanners.

The surveying service offered by the company can be appreciably cheaper than traditional surveying techniques, in that it is much faster. The high rate of acquisition and the accuracy of the data, in fact, ensure considerable time savings even when dealing

with highly complex geometries. Moreover, once the data has been acquired, each new elaboration and each new measuring process can be performed on the data without having to return to the place.

The survey can be performed from a considerable distance, of up to 2000 m (as a function of specific conditions). In this manner, objects or areas situated in places that are hazardous or hard to reach can be surveyed in full safety (as roads, rock slope, quarries, industrial plants...).

The laser system uses an active sensor and hence its operation does not depend on external lighting conditions; accordingly, this technique proves highly effective in the analysis of underground cavities.

The possibility of repeating the measuring process makes this technique ideally suitable for monitoring evolving situations and documenting temporary situations, to obtain detailed and quantitative assessments of geometric and morphological modifications.

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## Abstract

**A Brussels-based museum looks for a non-destructive paint stripping process in order to restore original Art Nouveau (1900) wall paintings (oil glaze) that have been covered by paint layers (latex-based) applied onto them later in the 20th century. The museum is open to various types of collaboration with craftsmen, SMEs or universities active in the cultural heritage sector.**

## Description

A Brussels-based museum looks for a non-destructive paint stripping process in order to recover the original wall paintings in several Art Nouveau buildings located in Brussels.

Built between the end of the 19th century and the beginning of the 20th century, most of these buildings have been either destroyed or modified, sometimes heavily, due to successive renovations or changes of affectation.

The Brussels-based museum at the origin of this technology request is currently involved in the restoration of several Art Nouveau buildings in Brussels that are to be returned to their original state, by retaining as much as possible of their original features and decorative elements.

While some of the rooms of the buildings such as the living & dining rooms were decorated with wallpapers, some other parts of the house such as the staircase were painted. During the life of the buildings and their successive refurbishments, these original paintings have been covered by other layers of paint.

The museum now wants to restore these original paintings by removing the other layers of paint (latex-based) that have been successfully applied onto them, without damaging the original paintings (oil glaze), which excludes chemical stripping or the so-called "compress" technique where the solvents used

are not able to dissolve the recent paint layers applied onto the original paintings.

The only solution found up to now is to manually remove the upper paint layers with a scalpel, but this technique is far too costly for treating all the surfaces to be restored.

## Technical Specifications / Specific technical requirements of the request

The stripping process should enable the restoration of wall paintings dating back to end of the 19th century or the beginning of the 20th century, by removing upper paint layers applied onto them later in the 20th century.

The 3-dimensional structure of the original dabbed paintings, which presents tiny picks of 2 to 3 millimetres height, should be preserved as well and not worn away by the stripping process.

The stripping process should not only be harmless to the original painting but also to the original glaze that covers it.

The surfaces to be restored may present some access difficulty such as in stairway halls for instance.

The stripping process should be reasonably priced, as it should be applied to large surfaces (several tenths square meters).

Optionally, the stripping process should also be applied to the restoration of painted low reliefs that have been also covered at a later stage by a latex-based paint.



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Restoration or re-crafting of golden lines of less than 2 millimetres in width, in original Art Nouveau decorative paintings (07 BE BIRC 0IKR) 

## Abstract

**A Brussels-based museum wants to restore or re-craft the original golden lines or threads that were less than 2 mm in width, in the framework of the restoration of Art Nouveau (1900) buildings. These golden ornamental lines were part of original decorative paintings in Art Nouveau buildings located in Brussels, and now they are to be restored or recreated. The museum is open to various types of collaboration with craftsmen, SMEs or universities active in the Cultural Heritage sector.**

## Description

Built between the end of the 19th century and the beginning of the 20th century, most of the so-called Art Nouveau buildings have been either destroyed or modified, sometimes heavily, due to successive renovations or changes of affectation.

The Brussels-based museum at the origin of this technology request is currently involved in the restoration of several Art Nouveau buildings in Brussels that are to be returned to their original state, by retaining as much as possible of their original features and decorative elements.

These golden lines or threads were often used in Art Nouveau decorative elements to border painted patterns such as arabesques for instance.

During the lifespan of the buildings and their successive refurbishments, the original golden lines may have been destroyed or damaged by being painted over or covered by wallpaper for instance.

The museum now wants to restore the original Art Nouveau golden lines or threads that have been damaged, or recreate them from scratch where they have been totally destroyed.

## Technical Specifications / Specific technical requirements of the request

- The major technical requirement is that the golden lines or threads must not exceed 2 millimeters width.
- The lines or threads must be either rectilinear or curvilinear such as in arabesques for instance.
- The lines can be either painted with gold dust or gold-bronze powder, or alternatively plated with gold leaves (also known as "gilding").
- The surfaces where the golden lines must be restored or recreated may present some access difficulty, such as in stairway halls for instance.

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Restoration of oil-based painted lines measuring less than 1.5 millimetres in width in original Art Nouveau buildings

(07 BE BIRC 0IKT)



## Abstract

**A Brussels-based museum wants to restore or re-craft oil-painted lines of less than 1.5 mm in width in the framework of the restoration of Art Nouveau (1900) buildings. These oil-painted lines are part of original decorative patterns in Art Nouveau buildings located in Brussels, which are to be restored or recreated. The museum is open to various types of collaboration with craftsmen, SMEs or universities active in the cultural heritage sector.**

## Description

Built between the end of the 19th century and the beginning of the 20th century, most of the so-called Art Nouveau buildings have been either destroyed or modified, sometimes heavily, due to successive renovations or changes of affectation.

The Brussels-based museum at the origin of this technology request is currently involved in the restoration of several Art Nouveau buildings in Brussels that are to be returned to their original state, by retaining as much as possible of their original features and decorative elements.

Oil-painted lines were often used in Art Nouveau patterns to ornate doors for instance.

During the life of the buildings and their successive refurbishments, the original oil-painted lines may have been destroyed or damaged by being painted over for instance.

The museum now wants to restore the original Art Nouveau oil painted lines or threads that have been damaged, or recreate them from scratch when they have been totally destroyed.

## Technical Specifications / Specific technical requirements of the request

- The major technical requirement is that the oil-painted lines must not exceed 1.5 millimeters width.
- The lines or threads must be either rectilinear or curvilinear such as in arabesques for instance.
- The lines must be painted with oil-based paint as it was originally done.
- The surfaces where the lines must be restored or recreated may present some access difficulty such as in stairway halls for instance.

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Know-how about shipping and packaging works of art, valuable and dangerous objects (06 ES BCAV 0GFP) 

## Abstract

**A Basque technology centre (Spain), in collaboration with an important museum, wants to develop new types of packaging for shipping artworks and any valuable or dangerous objects that require special conditions. They are looking for companies specialised in transporting this kind of goods for technical cooperation.**

## Description

Shipping of artworks, military arms or special objects requires high-quality packaging since most of them are valuable or dangerous, even both of them. Breakage or partial damage can occur if they are packaged carelessly or incorrectly. Also correct wrapping materials must be used to prevent mould, moisture tarnish, abrasion or other damage to the integrity of the objects.

Travelling exhibitions is a trend in many museums nowadays. This concept implies that art works are shipped several times from one museum to another. Therefore, it is important that packaging avoids damages and breakage that would result in millionaire losses. On the other hand, dangerous goods like military or pyrotechnic objects need secure packaging to prevent fatal accidents that could affect population. A Basque technology centre (Spain) in collaboration with an important museum wants to develop new types of packaging for high-profile markets (artworks, aerospace, pyrotechnics, military, etc). The technology centre has a great know-how about plastic and composites, and the museum has the knowledge about works of art (paints, sculpture, etc). They are looking for companies working on transporting objects with special requirements to provide know-how and to test the new packaging.

## Technical Specifications / Specific technical requirements of the request

The companies provide know-how about the different levels of packaging requirements in order to develop a suitable new product.

The physical characteristics of the object, the distance to be transported, mode of transportation, the time of the year it is to be shipped, and the number of locations where the good may be unloaded will determine the levels of interior and exterior packing requirements.

Partners should help to choose appropriate interior packing materials and exterior boxes, crates or travelling cases based on all these criteria.

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## Abstract

**A small Italian company delivering services in the cultural heritage sector is interested in improving a set of techniques for digitisation and virtual restoration of degraded texts, and incorporating them into a full-featured application. The company is looking for industrial and research partners working on multi-spectral imaging, digital image enhancement, dictionary creation, and automatic keywords extraction for technical cooperation.**

## Description

Physical deterioration of printed and hand-written texts is a critical issue for a number of important documents. In order to improve public and scientific access to such written materials and to ensure their preservation for the future, digital imaging of important texts is being undertaken by many institutions. However, degraded texts cannot be simply scanned and stored as digital images without further processing as, in many cases, the script is unreadable and deterioration of the text substrate itself may mean that important word fragments are hidden or missing. Typical problems with ancient documents are related to the fading of iron Gallic ink, typically used in the 16th and the 17th centuries, or to deterioration of poor-quality paper used in the 19th and 20th centuries.

A small Italian data processing company delivering advanced services in the cultural heritage sector (museums, libraries, private foundations, public bodies, etc.) has acquired a technique for digitisation and virtual restoration of degraded texts that is based on:

- Multi-spectral imaging to reveal hidden features in a damaged document
- Digital image enhancement techniques to achieve suitable segmentation of the characters so that OCR (Optical Character Recognition) can operate more effectively.

A demonstrator of such a technique has been already developed in cooperation with Italian and European research centres.

The approach is very interesting as it can be used to exploit the following features:

- Modularity, so that different components can be used for separate applications (e.g. only multi-spectral image acquisition, only image enhancement, only OCR, etc.);
- Suitability for large-scale routine preservation of degraded texts, being fast and capable of extracting the hidden features from a range of common degraded texts
- Requiring relatively low capital and running costs with comparison to previous techniques for virtual restoration of degraded texts used in high-profile projects, which are prohibitively expensive

The company is looking for industrial and research partners for technical cooperation to improve on the techniques and develop a full-featured application, as well as for public bodies interested in the experimentation and testing phases.

## Technical Specifications / Specific technical requirements of the request

Partners are sought to pursue the following enhancements:

- Construction and integration of special dictionaries for restoration of lost word fragments from ancient languages (e.g. Latin, modern languages from previous centuries, etc.)
- Extraction of keywords and other features for classification and archiving of digital documents
- More advanced and integrated multimedia and Web-based presentation of restored texts

Improvement of software for digital restoration of degraded texts using multi-spectral imaging

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