



LLP-LDV/TOI/07/IT/016



F- M U. S. EU. M.
(Form Multimedia System for a European Museum)

**THE MU.S.EU.M. PROTOTYPE OF VIRTUAL MUSEUM
AND THREE INTERNATIONAL CASE-STUDIES: A
BENCHMARKING OF THE PRODUCTS REALISED**

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**Leonardo Da Vinci Programme
Lifelong Learning
Programme 2007-2013**

F- MU.S.EU.M. Project

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**THE MU.S.EU.M. PROTOTYPE OF
VIRTUAL MUSEUM AND THREE
INTERNATIONAL CASE-STUDIES: A
BENCHMARKING OF THE PRODUCTS
REALISED**

Executive summary

This report aims to do a benchmark comparison of the outputs of the Report titled “Building a new concept of virtual museum: four case-studies on best practices“, devoted to the analysis of the two Virtual Museums from Europe, one from a non-UE country and the case of Virtual reality applied to archaeological sites, with the prototype of Virtual Museum realized within the project MU.S.EU.M. In particular, the three cases of Virtual Museum will be taken into consideration in this Study.

The prototype of Virtual Museum realised within the MU.S.EU.M. project, in fact, will be used as a model and basis for the implementation actions to be undertaken within the F-MU.S.EU.M. project in order to build a new European Virtual Museum, made with the contribution of ten European partners.

This report will compare the products of the above mentioned museums focusing, in particular, on: Articulation and contents of the products realised; Communication power of the Virtual Products taken into consideration; Databases realised.

INTRODUCTION TO THE METHODOLOGY

This Report will do comparisons of four products using a methodology called “Benchmarking”.

The Benchmarking is a method which an Organization can use in order to optimise processes, services, products through a systematic comparison with other institutions or organizations (*best in class*) which reached levels of excellence.

This technique appeared during the 80s, used by the great American companies with the aim of becoming more competitive in regards to the International companies.

For a benchmarking, it is important to identify some themes, deriving them from a previous analysis of the context and the issues affecting the process.

It is of capital importance to identify examples of “good practice” for the theme in question, each example or good practice having at least one aspect that could be useful to the overall process, even if that example as a whole could not be considered actually a "good practice".

Benchmarking comparisons can be used also by Non-Profit organizations; and ideal scheme of how to do a benchmarking analysis foresees the following:

“How we do it”	“How they do it”	“In what they are better than us”	“How could we do it ?”
Description through a check-list; basic information	Description through structured scheme	Pointing out several best practices	Pointing out conditions for a transfers action of the best practices; transfer of “know how”

From a preliminary survey of good practice it is possible to identify the main issues for each theme that are important for defining a model of the process.

Two different kinds of benchmarking can be distinguished:

➤ Quantitative benchmarking

It is done when we have exactly measurable indicators.

The aims of a Quantitative benchmarking is effective measurements of the process in different implementation environments;

➤ Qualitative benchmarking

This methodology examines the way in which a work is performed.

Several trend indicators and other measures are also used but the focus is on “method” and an examination of the alternatives.

This report will use the Qualitative benchmarking methodology, taking into consideration some of the most important characteristics of the products realized by four Museums and Institutions.

Special attention will be also given to the human resources devoted to the creation of the those virtual products.

1. THE CASES TAKEN INTO CONSIDERATION

This Report will take into consideration four products:

A. The first one is the prototype of Virtual Museum realized within the MU.S.EU.M. project (2000-2006), a EU-funded Project under the Leonardo da Vinci Action programme.

The project, which aimed to support competence building for a European virtual museum was co-ordinated by the Municipality of Rome (Department XIV - U.O. Professional Training) and included partners in Athens (National Archaeological Museum of Athens); Berlin (Museum für Vor- und Frühgeschichte); Bucharest (National History Museum of Romania); Budapest (Hungarian National Museum); Prague (Museum of History); Sofia (National Museum of History) and Vienna (Museum of Natural History).

MU.S.EU.M. was particularly focused on the communication in prehistoric age as theme of our virtual museum and the existence of stores of information and communicative channels able to support complex messages.

B. The Virtual Museum of Canadian Civilization and Corporation

C. The Marischal Virtual Museum, realized within the LEMUR project

D. The Pitt Rivers Museum

The last three Museums have been studied in detail in the Report titled “Building a new concept of virtual museum: four case-studies on best practices“, available at the address http://www.europeanvirtualmuseum.net/documenti/Four_case_studies_pdf.pdf

2. ARTICULATION AND CONTENTS OF THE PRODUCTS ANALYZED

2.1. The Virtual Museum prototype of the MU.S.EU.M. project

One of the objectives of the project MU.S.EU.M. was to make some of the most important museums of European capitals endowed with prehistoric collections protagonists in the ideation and in the construction of the prototype of a "Virtual Museum of the European roots".

Partners of the MU.S.EU.M. Project were:

- The National Archaeological Museum of Athens
- The Museum für Vor- und Frühgeschichte in Berlin
- The National History Museum of Romania of Bucharest
- The Hungarian National Museum of Budapest
- The Museum of History of Prague
- The National Museum of History of Sofia
- The Museum of Natural History of Vienna

In addition, Rome ACS Software house and Eddleston Innovation of Scotland supported the project.

The seven museums had a urgent need for systematic ICT competence building, and they progressed without systematic training (Vienna being the exception to the availability of systematic training).

The MU.S.EU.M. Project provided the possibility to them to be linked to a European network as well as the answer to the major challenge for them: the need to a training model to acquire the pedagogic competences necessary to support e-learning as well as the competences needed to design and manage a Virtual Museum as well as creating its contents.

Furthermore, not only the partner Museums had a digitalized collection, so for those who didn't have it, the Project provided the opportunity to start creating digital information about part of their collections.

It is remarkable that in the MU.S.EU.M. Project, virtual museums are seen as complementary rather than a replacement for physical museums; according to that, one of the first aims of a virtual presence is to attract increasing numbers of visitors to the physical museum. The task facing each virtual museum feature the following points.

- Maximise of information flows
- Preserve information over time
- Adopt ICT and conform with user and network standards for e-services
- Increase accessibility
- Personalise the organisation of the site and of the content according patterns of a segmented demand of cultural goods
- Increase the visits to the real museum

The product realized within the project MU.S.EU.M. is a portal composed by the following sections:

- Presentation of the MU.S.EU.M. project (outline; outcomes)
- Museums (part describing the European Museums participating in the project)
- Virtual Museum
- E-courses: 3 on-line courses (Web-designer for Virtual museums; Content expert for Virtual Museums; Manager for Virtual Museums) meant to be an on-line learning model
- Links (providing access to a huge quantity of international links to Research engines, Institutions, Museums websites)
- Site index
- A section devoted to the contacts

The Virtual Museum of the MU.S.EU.M. project is a *museum of museums*, activated on the Web and able to document how Europe is founded upon a common matrix, which is consequential to the absence of rigid boundaries, to continuous migrations and interactions and to a plurality of cultural roots and imprints.

The Virtual Museum provides access to a selection of items from the participating countries, documenting the prehistoric period, it is realised with an enchanting graphic and is accessible by 3 different criteria:

- **By period** (from 40.000 B.C. to 2.000 B.C.);
- **By geographic area** (of the participating counties: Italy, Germany, Austria, Romania, Bulgaria, Hungary, Greece);
- **By theme** (11 different theme are available: Calendar system; Currency; Decoration; Maps of the firmament; Mythogram; Motherhood; Music; Numerical code; Power or status sign; Script; Symbols).

2.1.2. The on-line learning model of MU.S.E.U.M.

The M.U.S.E.U.M project has been a training laboratory where experts and managers from seven European museums exchanged views, made decisions, created new instruments and learned new languages while creating together the first virtual museum of European roots.

Participants in this laboratory – and in the project – can be seen as a scientific and technical community which is, in terms of interests, experiences and roles, and beyond obvious differences linked to the national backgrounds, a real community of practices necessarily and purposely evolving towards an informal on-the-job learning community.

With reference to the results of the learning programmes, it can be said that the project team, composed by key professionals from seven partners museums, has performed the following education both in cognitive (knowledge) and operative (know-how) terms:

- Learned how to design the architecture of a database, necessary for the creation of the virtual museum;
- Became familiar with the modalities of use of the database;
- Created a cataloguing standard of museum goods through the elaboration of an identikit card; This is particularly significant since the museums involved in the project were not able until now to elaborate such standards by sharing their criteria.

The creation of the virtual museum has therefore implied participation modalities among all the project beneficiaries: constructing together the Virtual Museum of European Roots allowed to learn, more or less consciously, new ways of working together, where individual input was immediately compared to others and the final product was, in fact, a collective output.

Starting from this analysis of the project as far as the “learning performed” is concerned, it was possible to elaborate a structured training programme (the training pattern) focused on specific targets.

Through the implementation of different types of activities which were particularly relevant for the creation of the training pattern, the M.U.S.E.U.M project has enabled, on the one hand, to identify the best practices related to on-line museum supply in Europe and, on the other hand, to perform a mapping of new roles and professions on the basis of cases of excellence as well as an analysis of competences and training needs within the 7 partner museums participating in the project. Such earlier activities enabled the project to design a model of a training programme for the main professionals interested in the creation of a virtual museum, which has been tested on-line by the human resources identified by the managers of partner museums.

The logical framework of implemented activities has enabled not only to develop such activities from a training point of view – they were used in this case as information sources for the analysis of needs – but also to create an efficient training programme on the basis of the gap between existing and missing competences.

The learning model was therefore created following several steps:

- Analysis of the best work organisation to create and manage a virtual museum
- Identification of key professionals directly involved in the work process
- Identification of training needs of these professionals
- Translation of training needs into skills needs
- Differentiation between basic skills and specialised skills
- Weighting of basic skills and identification of specialised skills for each key
- Identification of three key professionals (contents expert, web expert and project manager) for testing the training pattern
- Breakdown of the training programme into training units (to be capitalised), didactic units and learning objects

Three training programmes for the following profiles: contents expert, web expert and project manager.

The tasks and responsibilities linked to the design and management of a virtual museum can be associated to these professional profiles.

The three e-courses were followed by 16 persons, 7 of which were staff members of the following M.U.S.E.U.M partners.

The remaining 9 persons who followed the programmes were as follows:

- 3 experts in archaeology
- 3 experts in museum communications
- 2 experts in training design and evaluation
- 1 expert in human resources management

The Web site and the “Virtual museum of the European roots” are not a separate area from the training model, but an integral part of it and a support for it. In fact the access to the e-courses is through the Web site and the content of the e-courses derive from the information made available by the Virtual museum as well as from the M.U.S.E.U.M. laboratories for training experimentation online and on the job.

The experimental and innovative nature of the training programme created ad hoc and tested within the M.U.S.E.U.M project allows us to reflect and consider possible improvements, which were already mentioned during face-to-face laboratories and could be used as a basis for a reformulation of the training programme.

The training programmes are strongly connected to the needs that have generated them, i.e. the need to design and manage a virtual museum.

During the laboratories, the following conclusions were drawn:

The e-courses programmes keep the same characteristics as the experience fulfilled through the M.U.S.E.U.M. project; given the innovative nature of the project, there have been equal relationships between actors and beneficiaries finalised at the fulfilment of the project objectives

The didactic and pedagogic approach used does not consider the classic asymmetry between student and teacher but enables to create a learning programme self-managed and with the support of experts

The same expertise does not come from outside but belongs to participants in the

M.U.S.E.U.M. project who represent, as such, a proper learning community.

Flexibility of the programmes

The training design is based on a modular approach which enables a flexible use of the training programmes, not only in time (thanks to independent didactic units, a programme can be followed in sequence or at different periods in time) but also possibly putting together didactic units (modules) in a different way according to the needs (for instance, if the contents expert needs major information regarding IT aspects, the didactic units included in the web designer programme can be used). In the pattern, the basic element of the learning programme is in fact the training unit to be capitalised (TUC).

Focus on competences

The methodological approach is the one defined as a competence-based approach, which takes into account, as training outputs, the multiple aspects of the learning process, not only in terms of knowledge but also in terms of know-how and behaviour. The design of competence-based and TUC-based training activities enables to customize and make the programmes flexible according to a progressive capitalisation of competences acquired in time and, in parallel, to give them transparency with respect to the different types of other training beneficiaries (companies, training agencies, etc.).

Modalities of use (residential/face-to-face and distance)

Besides the distance learning modality, there is a need to adopt also face-to-face training and to involve in the training activity two types of professionals: The tutor, as an animator of the forum, and at least two thematic experts for the web designer and the contents expert positions. Face-to-face laboratories enable to solve doubts and answer queries in real time and to benefit from the stimulating input of all participants, using also more spontaneous and emotional channels.

The training pattern of the M.U.S.E.U.M project can be transferred, after making the necessary modifications, in other learning contexts.

In particular, for more strictly methodological aspects, the training pattern can be used in other cultural services or working sectors (services companies, small and medium companies, mutual companies) such as the following.

Adult lifelong learning and continuing training in the field of culture as awareness museum subject;

Post-graduate education and managerial training, i.e. when the training supply is designed for a particularly motivated audience able to manage itself autonomously, as in the case of the M.U.S.E.U.M. beneficiaries. In this case, the initial professional profiles and competences of individuals interested in the training programme should be upper-middle level. Moreover, the proposed approach requires a high motivation and the sense of belonging to a learning community;

Individual learning, i.e. when the individual use or the programme is considered as not only possible but also desirable. This is the case of professionals, businessmen and self-employed, with a background of competences and knowledge, who need specific additional ones (as in the case of the management of a virtual museum) or openings on particularly innovative fields within their specific profession.

The Prototype of Virtual Museum

MAIN CHARACTERISTICS

PRODUCTS	YES/NOT	COMMENT
Database	Yes	A database is available. It holds a selection of artefacts from the collections of the participating
Virtual exhibition	No	No virtual exhibition has been realized
Use of Virtual reality	Yes	High level of Virtual reality with particular regards to the items, which can rotate and are viewable in 3D
Other services and outputs	Yes	Three courses are available on-line
Special educational tools	Yes	A deepening section is available for some of the items displayed
Multilinguality	No	The web site is entirely available in English

Table 1 – The MU.S.EU.M. prototype articulation and contents

The Prototype of MU.S.EU.M. HUMAN RESOURCES	
PRODUCTS	YES/NOT
Internal staff devoted to the creation management and maintenance of the Virtual Museum	Yes
Internal training programs for the museum staff	No

Table 2 – Human resource employed for the MU.S.EU.M. Prototype realization

2. 2. THE CANADIAN MUSEUM OF CIVILIZATION AND CORPORATION

The Canadian Museum of Civilization is a portal available in 2 languages (English and French), holding the websites of five different museums:

- The Canadian Museum of Civilization
- The Canadian Children's Museum
- The Canadian Postal Museum
- The Virtual Museum of New France
- The Canadian War Museum

The Web site is very articulated, divided into six main sections (Archaeology; Arts and crafts; Civilization; Cultures; First people; History and military history).

The Virtual Museum of Civilization.ca, realized with a dynamic, enchanting graphic, provides access to over 100 exhibitions and many other services. It hosts special portals targeting children, teachers, and scholars, and provides access to remarkable educational tools, like Cybermentor, an online distance education feature, and an interactive educational game which can be played online, using Flash technology.

Furthermore, the Museum uses some audio-visual tools, like shorts films.

A huge database (with over 200,000 items) is available in English and French. It is possible to do searches within it by two criteria:

- Collection groupings
- Categories

The Canadian Museum of Civilization and Corporation		
PRODUCTS	YES/NOT	COMMENT
Database	Yes	A huge database is available. It is provided in two languages (English and French)
Virtual exhibition	Yes	A great number of exhibitions are available (well over then 100)
Use of Virtual reality	Yes	Very high level of Virtual reality is used, with particular regards to the realization of completely virtual environments (see the Inuit Virtual Museum), for the possibility to do a virtual tour of the Museums and to see the displayed items in 3D
Special educational tools	Yes	Audiovisual tools, educational games, tools for e-learning.
Multilinguality		Yes; all the web site contents are available in two languages, English and French

Table 3 – The Canadian Museum of Civilization and Corporation articulation and contents

The Canadian Museum of Civilization and Corporation

HUMAN RESOURCES

PRODUCTS	YES/NOT
Internal staff devoted to the creation management and maintenance of the Virtual Museum	Yes
Internal training programs for the museum staff	Yes

Table 4 – Human resource employed for Canadian Museum of Civilization and Corporation realization

2.3. The Marischal Virtual Museum

The Museum web-site provide access to:

- General
- Collections
- Exhibitions
- Learning
- Home

The *Collection* provides access to the Virtual Museum and to the “Lemur Database”.

The Marischal Virtual Museum is a full record of views, QTVR panoramas, captions and layout of the museum galleries.

It is underpinned by a rich database of thousands of objects, including all those on display, making it a rich resource for many purposes.

The Virtual Museum is divides into 4 main sections:

- Home
This section shows a short presentation of the Virtual Museum
- Plan
This part hosts a map of the museum, divided by floors.
By clicking on specific symbols, it is possible to explore the museum rooms and objects, viewable in 3D. It is possible to explore the museum’s rooms starting from the main entrance, through the Entrance hall, up to the stairs and the rooms on the upper floors.
- Index
The *Index* allows visitors to do searches in the Marischal collections and topics.
- About
The *About* section gives useful information about the Marischal Virtual Museum and about the Lemur Project, within which the Virtual Museum has been realized. Many links in this section provide access to the Lemur Project Home page as well as to the Marischal Museum home page.
- Search

This section allows visitors to discover the collection of the museum, and to do searches of specific items thanks to a very simple form, suitable also for a non-specialist audience.

The Marischal Virtual Museum		
Main Characteristics		
PRODUCTS	YES/NOT	COMMENT
Database	Yes	A very huge database of thousands of items is available. The database brings together a wealth of material from the University's collections that can be used for teaching in the Arts, Social Sciences and Sciences not only at Aberdeen but also more widely throughout the Higher Education community.
Virtual exhibitions	No	It is planned to realize some Virtual Exhibitions, at the moment not available.
Use of Virtual reality	Yes	It is possible to do a virtual tour of the Museum floors as well as of some of the rooms. Several items are displayed in 3D.
Special educational tools	No	the prime purpose of the project the database and Virtual Museum were designed to be flexible resources, the teaching needs of individual members of staff meant that they were used in a variety of different ways.
Multilinguality	No	

Table 5 – The Marischal Virtual Museum articulation and contents

The Marischal Virtual Museum

HUMAN RESOURCES

PRODUCTS	YES/NOT
Internal staff devoted to the creation management and maintenance of the Virtual Museum	Yes
Internal training programs for the museum staff	Yes

Table 6 – Human resource employed for building the Marischal Virtual Museum

2.4. The Pitt Rivers Museum

The Museum's web site provides access to the following:

- Home
- Visit the Museum
- Explore the Collections
- What's on

"Explore the Collections" provides access to the following:

- History
- Information sheets
- Virtual Resources
- Collection databases
- Virtual Tour
- Resources for Researchers
- Resources for Teachers
- University Courses
- Publications
- Current Research
- Balfour Library
- General Services

The Pitt Rivers Virtual Museum

Main Characteristics

PRODUCTS	YES/NOT	COMMENT
Database	Yes	A huge database is available in English: the Collection database allows visitors and researchers to find information about the artefacts using 2 separate catalogues, one for all artefacts, and the other for historic field.
Virtual exhibitions	No	
Use of Virtual reality	Yes	It is possible to do a virtual tour of the Museum floors as well as of some of the rooms.
Special educational tools	No	the prime purpose of the project, which was higher education teaching and learning, the database and Virtual Museum were designed to be flexible resources, the teaching needs of individual members of staff meant that they were used in a variety of different ways.
Multilinguality	No	

Table 7 – The Pitt Rivers Virtual Museum articulation and contents

The Pitt Rivers Virtual Museum

HUMAN RESOURCES

PRODUCTS	YES/NOT
Internal staff devoted to the creation management and maintenance of the Virtual Museum	Yes
Internal training programs for the museum staff	Yes

Table 8 – Human resources employed for building the Pitt Rivers Virtual Museum

3. Summary and analysis of the Virtual Museums articulation and contents

Table 9 shows a synoptic summary of articulation and contents of the four Virtual products:

PRODUCTS	The MU.S.EU.M. prototype	The Canadian Museum of Civilization and Corporation	The Marischal of Museum	The Pitt Rivers Museum
Database	Yes (about 80 items displayed)	Yes (over 200,000 items available in the database)	Yes (thousands of items)	Yes (thousands of items)
Virtual exhibitions	No	Yes	No	No
Use of Virtual reality	Yes; Very high quality of 3D pictures, available for any items of the database.	Yes; very high use of Virtual reality for Virtual exhibitions and 3D images of the items displayed in them.	Yes; Good level of Virtual Reality (3D pictures of part of the collection; possibility to do a virtual tour of the Museum)	Yes; Virtual tour of the Museum available.
Special educational tools	No	Yes	No	No
Multilinguality	No	Yes	No	No
Other products	<ul style="list-style-type: none"> ▪ 3 e-courses available; ▪ Very reach link-section (several international links); 	A specific section provides access to selected information and knowledge as well as bibliographies.	No other special service	<ul style="list-style-type: none"> ▪ Possibility to order pictures; ▪ Resources for researchers (many links to research Institutions); ▪ Providing access to several international links

3.1. The Databases

The databases of the cases taking into consideration are generally very huge.

Compared with the databases of the three Museums, the database of the MU.S.EU.M. prototype is less articulated and smaller, with about 80 items displayed. Nevertheless, it is very easy to consult it, both for a specialist and for a non-expert audience.

The database of the Canadian Museum of Civilization and Corporation seems to have the higher number of items (over 200,000 items), together with the most high number of searching criteria.

It is easily accessible also for a non-specialist audience and allows visitors to find out items on the basis of specific themes, categories or collection.

The databases of the Marischal Museum, realized within the LEMUR project, contains thousands of object and allows visitors to do searches by many criteria: it is possible, in fact, to search by inventory number; collection; artist; description; period; date; place; material; kind of acquisition, and other criteria. Its searching criteria are richer than the ones of the MU.S.EU.M. prototype, but maybe it is a little bit more complicated for a virtual visitors to do searches within it rather than within the MU.S.EU.M. database.

This huge range of possibilities to do searches is probably due to the fact that the Marischal Museum is linked to University, and its Virtual Museum is built taking in mind the specializes audience (scholars, researchers). Nevertheless, these search criteria may make this on-line catalogue easy to explore also for young people and non-expert adult visitors.

The database of the Pitt Rivers Virtual Museum allows visitors to do searches by several criteria (Items number; type; name; geographic area; Cultural group; Collector; artist; Original owner; technique used for its realization).

The searching criteria of the database are written with a easy to understand and friendly way, which may help visitors to familiarize with it.

What is remarkable of this comparison among databases of the products taken into consideration is that whilst the database of the MU.S.EU.M. prototype allows exploring the items and see them in 3D, only the database of the Marischal Virtual Museum allows it.

The databases of the Canadian Museum of Civilization and Corporation as well as the Pitt Rivers Museum only give information, also if in depth and very detailed, about the objects but the visual contact with them is not allowed.

This clearly faces a limit to the understanding and to the knowledge of the objects, and to the concept of virtual museum.

Another important point which needs to be stressed is that, once chosen the criterion for the research (period; geographic area; theme) the MU.S.EU.M. database allows the synoptic vision of all the relevant elements related to the selected item, avoiding the dispersion of information. Furthermore, the information are given within a frame realized with an enchanting graphic. This is an element that is absent in the databases of the other Museums, taken into consideration.

3.2. Virtual Reality and Educational tools

What is remarkable is the intensive use of Virtual reality made by the Canadian Museum of Civilization and Corporation, one of the most successful case of the four Museums studied. Meant to communicate to a vast and articulated audience, Civilization.ca provides access to lots of educational tools, mostly realized with enchanting graphics, 3 D pictures, audio-visual tools; also the high number and the very good quality of the exhibition realized make this Virtual Museum something new, an added value respect the actual Museum.

Multylinguality is the other point of strength of Civilization.ca.

In comparison to the cases of Museums taken into consideration, the Prototype of MU.S.EU.M. has more intensive use of 3D pictures but doesn't have virtual exhibitions.

Nevertheless, none of the three Museums taken into consideration

Has realized anything similar to the innovative on-line learning model of MU.S.EU.M., which is a great resource for the Institutions participating in the Project to self manage, design and create their Virtual Museum contents.

4. IMPLEMENTATION OF THE MU.S.EU.M. PROTOTYPE: F-MU.S.EU.M. PROJECT SPECIFIC AIMS AND EXPECTED OUTCOMES

4.1. F-MU.S.EU.M. Project description

Following the experience and the products realized within the MU.S.EU.M. Project, a new project, the F-MU.S.EU.M. Project, will be realized.

It will be focused on the transfer and systematisation of outcomes and outputs achieved and realized during the implementation of the project MU.S.EU.M. , with particular regards to European Museums of local, regional level whilst the partners of the previous project MU.S.EU.M. were of National level.

Although within a context of experimentation, it has been proved the effectiveness of the training, organizational and communication Model produced during that project, in answering to the increasing need, within the museum sector, of new professional competences concerning the planning and management of a mix of culture-art-technology-economy, implying innovative modalities to present and divulge cultural heritages that symbolize not only the specific national identities, but also the European one.

Among the expected outcomes of the new project F_MU.S.EU.M., also in terms of impact and in addition to the further development of the existent website and to the improvement of the competences of the targeted - professional profiles, can be listed the following:

- Updating data and information (on European scale and starting from a field analysis), related to the occupational and training needs of the different professional profiles working within the sector of the museum data transmission offer, in order to foster and support the guidance process addressed to both young unemployed and adults in need of professional retraining, and providing a tool for the elaboration of a strategy aimed at facing the labour market;
- Creation of a Network for the continuous training of European museums, given the meaningful transnational character of the project;
- Providing the partner representing countries recently entered in Europe with the opportunity of adopt and experimenting training innovative and technologically advanced practices, that can support the process - still in progress - of

modernization of the public administrations, being the last a priority indicated by the European community in the pre-admission period.

Other specific goals of the F-MU.S.EU.M project are:

- To realise a transfer action so as to foster the development of 4 specific professional branches of the museum sector, such as: management, technical, contents, communication, in order to answer to the fast evolution that the technological and organization innovations are imposing to the management and valorisation of cultural properties by wider and wider categories of users;
- To promote the adoption of the F-MU.S.EU.M. innovative lifelong learning model, through the contents, linguistic and technological updating of the prototypical product;
- To realise the necessary adjustment of the training model through the activation of local laboratories for the experimentation, within the 3 countries partner.

4.2. The Partners of the Project

- The Partner of the F-MU.S.EU.M. Project are:
- The Regional History Museum “Academician Jordan Ivanov”, Kyustendil, Bulgaria;
- The Civic Museums of Pitigliano, Italy;
- The Banat Museum, Timisoara, Romania

Six other Museums are the Beneficiary partners of the Project, which will represent a real laboratory for the transfer action of the prototype of Museum:

- The The Regional Museum of History of Veliko Tarnovo, Bulgaria
- The Ruse Regional Museum, Bulgaria
- The Civic Museum of Farnese, Italy
- The Fiora Valley Prehistory and Protohistory Museum of Manciano, Italy
- The Brukenthal Museum, Romania

- The Deva Museum of Dacian and Roman Civilization, Romania

These nine Museums have a very different background if compared to the nine Museums of the previous Project MU.S.EU.M., not only because of their level, which is local and not national, but also for their competences about ICTs and for the poor quality of their web sites.

The SWOT analysis of the nine participating museums (see the Report “*Building a European Virtual Museum. A SWOT analysis of nine Museums*”, available at the address: http://www.europeanvirtualmuseum.net/documenti/research_1.pdf) reveals that all the nine Museums, which in the majority of the cases have a local audience, need to increase ICTs competences of their staff.

In most cases, the web presence is not of high level, with web sites available only in the local language and, furthermore, externally controlled and managed.

It is also to be stressed the need for these local Museums to improve or develop new services and competences, as the e-commerce, the virtual merchandising, and increase its web presence so as increasing their audience and promoting its huge heritage.

The other external elements of weakness and threats for all the Museums come, in order of importance, from:

- Lack of human resources
- Lack of funds
- Low level of linguistic competences of the staff

Looking, in particular, to the process of migrating to a Virtual Museum, the position of the participating museums is weakened by the lack of professional profiles skilled in the following fields:

- Elaboration of pedagogical contents for a virtual audience
- Creation of specific cultural contents suitable for a virtual product
- Communication of cultural contents to a virtual audience
- Web expertise (with particular focus on the web design and development)

4.3. Final outputs of the Benchmarking and actions to be undertaken for achieving the F-MU.S.EU.M. Project goals

From the comparison of the MU.S.EU.M. prototype with the three cases of Museums, it is possible to point out the following innovative characteristics of the Virtual Museum of European Roots, which make it a unique product:

- It has been produced within an international context, made of a network of relevant European Museums
- Uses and enchanting graphic
- With a high communicational power
- Providing access to a unique on-line learning model

The analysis of the three European Museums compared to the MU.S.EU.M. Prototype suggest that to improve the Virtual Museum prototype and develop its potentials is necessary:

- To increase the use of Virtual reality, further improving the quality of the 3D pictures of the items forming its Virtual Collection
- Increase the number of the items in the *Database*
- Creating new thematic itineraries so as to realize something similar, but, at the same time, new with respect to the Virtual exhibition provided by many Virtual Museum, like the Canadian Museum of Civilization and Corporation
- To develop multilinguality: multilinguality is among the most important point on which the MINERVA project insists
- To improve the on-line learning model, translating the three e-courses available and creating new ones
- To train staff internal to the partner Museums

In conclusion, taken into considerations the outputs of the Research on the best practices in building a Virtual Museum as well as the outputs of this benchmarking, it is possible to state that the objectives of the F-MU.S.EU.M. project will be achieved thanks to the updating of the MU.S.EU.M. prototype products and through:

- The definition of new contents related to the professional skills of the museums experts, particularly involved in the technological changes;
- The adoption of distance-learning methodologies online and in situation;
- The realization of educational products for the training of 4 professional profiles (managers, techniques, contents and communication experts)
- Activation of learning laboratories in 3 countries of the partnership, in order to test the results of the methodology and products of the project.
- The creation of a Network for the lifelong education in the European museums.