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DELIVERABLE REPORT

D 8.7

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1. Executive summary

This Deliverable describe V-MUST portal, called also in previous deliverable 3rd phase website. It is accessible for registered users (initially just partners than also associated members) from www.v-must.net.

2. Introduction

V-MUST.net website (www.v-must.net) has been developed from the beginning of the project (Febr.2011). The website is the major communication medium for the project.

The website is also planned to be a major repository of knowledge and documentation for the project partners and a platform for cooperation.

3. Improvement of the 3rd phase portal

3.1 News editing

(L. Rescic, CNR ITABC)

News editing has been improved, through manual editorial work. New information added by partners in the website, through the editing CMS, have been added as News in the "News" section .

3.2 Multimedia and Press

The section called "Media" in the 1st phase portal has been renamed "Multimedia and Press". In this section only content types "Video" and "Press releases" are shown. Content type "Documents" and "Publications", formerly included in the old "Media" section, are now shown in the "Library" section.

A further improvement will be oriented to add In the home page a box showing the latest v-must video.

The video section has been re-organised. Categories of video material will be introduced. One video for each workpackage activity will be prepared as to provide a nicer and more immediate

way to communicate to the external world what is going on in v-must

3.3 Social activities integration

In the v-must.net home page a Twitter stream is displayed in a box on the left colum. It shows the latest tweets and it offers a textfield to send a twett mentioning @v-must account. This is useful to promote the conversation with v-must.net.

Similar streams for Facebook and linkedin groups have been discarded because of the change in the policy of those social networks in allowing the access to closed groups data.

A quick share button has been added to the following sections: Activities, Virtual Museums, Multimedia&Press, Library, Technology, Opportunities, Blogs, News, Schools. It is provided by the service http://www.sharethis.com/

3.4 Access to Services

Under the **Technology** menu the **Tools and Services** submenu gives access to tools and services developed by v-must, part of the V-MUST PLATFORM. They are divided in accordance to the two type of users: ICT developer and Content developer.

A grid of services is presented to the user, with a title, a short description and an external link to access every service. Login will be required once a service link has been clicked.

This section will be fully available after the closing of Call1 and Call2 identification.

3.5 Access to Interactive Testbeds

Six testbeds have been selected by a call and are now under development and in some cases under evaluation at Allard Pierson Museum. Each testbed has a Blog page updated by each developer (http://www.v-must.net/blogs/virtual-museums-blogs). Among those 6 case studies, 3 of them are on line virtual museums: **Livia's villa web3d**, **Apa Game** and **Virtual Rome.** At the moment those interactive web3d examples are hosted in specific url because they are under testing, but after the end of the evaluation period they will be accessible through the portal.
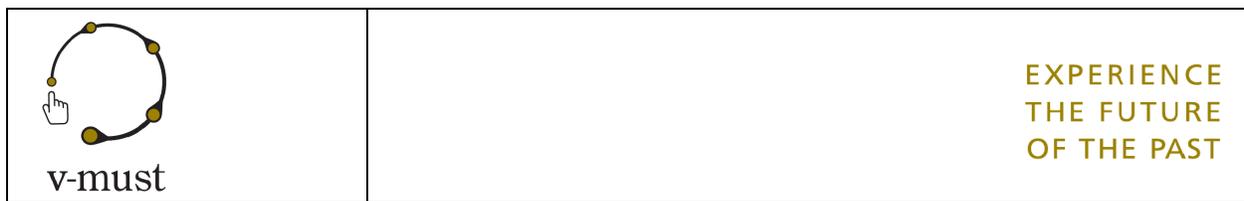
3.5.1- Livia's Villa web3d

Blog available at: http://www.v-must.net/blogs/vm/Flaminia-Reloaded
The web3D environment is now accessible at
http://192.167.233.8/guidoluccibaldassari/AllardPiersonMuseum/

3.5.2- Apa's Game

Blog accessible at: http://www.v-must.net/blogs/vm/Apa-Game

Interactive game: at the moment the game is a ZIP with an EXE stored in V-MUST platform. In order to play the game, the evaluators have downloaded a .zip file with the game files. Inside the main folder there is an .exe for Windows:

http://192.167.233.8/owncloud/public.php?service=files&t=a05f3837721837321ac0ddf5001fe80d

Information on the game and its background are available here:

http://www.eclap.eu/portal/?q=it/node/3161/objects&page=64#axoid=urn:axmedis:00000:obj:9fc6c0b7-0273-4b49-abc8-77d988a9292c&section=group_result&cd=647&n=1040

and in V-MUST platform (the forge)

https://hpc-forge.cineca.it/files/visit_Dissemination/public/ApaGame/

3.5.3- Virtual Rome

Blog accessible at: http://www.v-must.net/blogs/vm/Virtual-Rome

The interactive application is available at the moment as ZIP to be downloaded (the zip includes a portable version of Mozilla Firefox containing the plug-in (OSG4WEB) http://192.167.233.144/public/app.zip. Once unzipped, evaluators just need to click the "vrome.bat": that will launch a portable Firefox browser with the link ("VirtualRome full-screen") to the VRome app for touch U.I.

Virtual world and interface elements are remotely streamed, so there is no need to update the app as we operate uploading 3D models, welcome panels, icons, pins and other into the cloud.

3.6 Statistics

The web portal has been visited by more than 20,000 people. Most visited pages have been: the home (www.v-must.net), the virtual museums page (www.v-must.net/virtualmuseums and the page of opportunities (www.v-must.net/opportunities). V-Must website statistics (2013-02-01 – 2014 -01-31) have been taken from Google analytics:

More than 63k people visited the site

	Number of Hits (2014)
	observed: 10/10/2014
total visits	63,466
unique visitors	40,293

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pageviews	234,247
most viewed page after home	/virtual-museums
most used OS	Windows
most used Browser	Chrome
most used mobile OS	iOS/Android
most represented country	Italy
most used language	en-us
average visit duration	0:03:27

Demographics stats:

Country		Visits	% Visits
1)	Italy	9,270	30.56%
2)	Not detected	2,874	09.47%
3.	United States	1,935	06.38%
4.	United Kingdom	1,718	05.66%
5.	Spain	1,589	05.24%
6.	Netherlands	1,027	03.39%
7.	France	985	03.25%
8.	Germany	716	02.36%
9.	India	634	02.09%
10.	Belgium	582	01.92%

Browser		Visits	% Visits
1.	Chrome	10,056	33.15%
2.	Firefox	6,912	22.79%
3.	Safari	4,504	14.85%
4.	Internet Explorer	3,427	11.30%
5.	Opera Mini	2,938	9.69%

6.	Android Browser	1,133	3.74%
7.	Opera	371	1.22%
8.	Safari (in-app)	262	0.86%
9.	S40 Ovi Browser	172	0.57%
10.	UC Browser	97	0.32%

Operating System		Visits	% Visits
1.	Windows	17,427	57.45%
2.	Macintosh	5,544	18.28%
3.	(not set)	2,827	9.32%
4.	iOS	1,620	5.34%
5.	Android	1,603	5.28%
6.	Linux	734	2.42%
7.	Series40	172	0.57%
8.	SymbianOS	159	0.52%
9.	Samsung	76	0.25%
10.	Nokia	67	0.22%

Refferral website:

Source / Medium	Visits	% New Visits	New Visits
google / organic	15389	66,22%	10191
(direct) / (none)	8056	67,12%	5407
facebook.com / referral	911	61,36%	559
digitalheritage2013.org / referral	565	61,95%	350
linkedin.com / referral	313	36,10%	113
vhlab.itabc.cnr.it / referral	259	37,45%	97
m.facebook.com / referral	242	74,38%	180
first.aster.it / referral	222	77,48%	172
archeomatica.it / referral	220	56,36%	124
archeologiavirtuale2013.wordpress.com / referral	196	53,57%	105
Total	30334	65,87%	19980

Refferal SN

Social Network	Visits	Pageviews
Facebook	1153	3047
LinkedIn	317	1197
WordPress	223	707
Twitter	170	340
Blogger	129	731
Meetup	110	503
Tumblr	37	63
Academia	8	33
Netvibes	6	54
Pinterest	2	2
	2160	6684

Most viewed path:

Page	Pageviews	Unique Pageviews
/	**18348**	**13197**
/virtual-museums	**3624**	**2603**
/opportunities	**3051**	**2201**
/activities	**2704**	**2029**
/about	2544	1868
/schools/international-virtual-heritage-school-2013	1923	1281
/schools/italian-virtual-heritage-school-virtual-archaeology-0	1680	1385
/schools	1610	1213
/opportunities/mobility	1603	890
/virtual-museums/all	1505	879
	104266	77480

4. Services accessible through the portal

4.1 Internal

4.1.1 Web Editing Interface

The V-Must Portal is based on Drupal CMS. The web editing interface is bult in the CMS itself. Once the user is logged in by clicking on the "login" link in the main menu, an administrative toolbar is overlayed onto every Portal Page. From the toolbar the user may choose:
- Content: for browsing, filtering and modifying the existing content
- Add Content: for creating new content.

Drupal features a very flexible permissions system that allows the definitions of many editor roles. Every role has permissions to create/modify only the content types belonging to some portal section. For example an "Activity editor" may create/modify/delete only "Activities" section and all its subsections.

4.1.2 Blog service

Blog service is part of the Drupal CMS, so blog users are accessing the same web editing interface of section 4.1.1.

4.2 External

4.2.1 Alfresco Document Repository

What is Alfresco?

Alfresco is a scalable and extensible enterprise/ document content platform.

How does it work?

Alfresco has been set up for V-MUST project by Fraunhofer IGD (alfresco.igd-r.fraunhofer.de). It allows users to fully manage any type of content from simple office documents to images, photographs, video files etc. Moreover Alfresco enables users to automate document-intensive business processes, increasing efficiency and accuracy.

How did V-Must Network implement Alfresco into its workflow?

The V-Must Network adopted this powerful platform in order to:

- · **Store and manage documents** regarding V-Must partners and associated members activities. Alfresco provides document management services needed to allow V-Must users to organize files and automate document repository processes
- · **share secure files** among partners, associated members, consultants, contractors, external agencies
- · **work remotely**. It allows optimized online file collaboration solutions to be performed among the several partners and associated member that are spread all over the world.

4.2.2 HPC Forge

(including SVN, WebDAV, Track, Owncloud)

What is HPC-Forge?

HPC-Forge (High Performance Computing Forge), is an enterprise software suite that offers an integrated approach to many widely adopted open source software, commonly used for team development of heterogeneous digital contents: SVN (subversion), WebDAV, Track, Owncloud (community edition).

How does it work?

HPC-Forge, developed by CINECA, allows IT specialists to deploy easily a fully integrated team development suite. The digital assets could be managed in different ways, depending on the users needs. The svn versioned approach, allows a data oriented full control on the production process, tracking any change during the assets/code development. The direct and agile WebDAV is useful to access and store any kind of data that doesn't need to be intensively monitored and modified. Track provides to team leaders a way to supervise easily the production progress from a wide perspective but also in detail for each member of the workgroup. Owncloud allows the creation of a powerful custom scalable cloud solution, with many integrated capabilities (versioning, recovery, workgroup management, data protection…), with an easy-to-use client application, suitable also for non-IT users.

How did V-Must Network implement HPC-Forge into its workflow?

The V-Must Network adopted this production platform in order to:

- · Store manage and exchange digital assets: V-Must partners and associated members use this tool as a secure interchange system for large and structured digital assets.
- · Team work from different geographical locations: V-Must partners and associated members cooperate on different projects, working on digital assets (or qualified sub-sets) shared between institutions. The system allows to keep track of changes, users, access, offering also disaster recovery capabilities. The progress of the overall production process could be monitored, as well as the group and single users

productivity.

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4.2.3 ModelConvert

The V-Must Model Convert pipeline (http://pipeline.v-must.net) is a web service for the preparation and conversion of 3D models for online applications, with a specific attention to the needs of online Virtual Museums.

It is based on the "Common Implementation Framework" (CIF) developed in V-Must which provides stakeholders and application developers with tools and services to support the development of Virtual Museums; it follows a specific focus on presentation and visualization of Cultural Heritage assets in online virtual museums. The design of the CIF is based on analysis of the typical modeling workflows in the Cultural Heritage domain, and it is designed to overcome the perceived limitations of current technologies, such as overcoming the complexity of deployment of 3D content on the Web.

For an detailed technical description of the CIF we remind to the related papers [1,2,3] and to the deliverable 5.1 and 5.2. Additionally, the source code of the Model Convert is available on GitHub (https://github.com/x3dom/pipeline/).

The application templates available through the Model Convert are:

· Basic Viewer
· Standard Viewer
· Fullsize Viewer
· Metadata Browser (xml metadata)
· Radiance Scaling
· CAD Viewer
· Walk Through
· POP Geometry
· Nexus conversion

Each application templates converts the uploaded model in a way suitable for the specific application template (typically, a X3DOM representation of the input 3D model is generated) and then it includes the model in a web page that provides the specific visualization for the chosen application. The model can be also cleaned/optimized before to be converted through MeshlabServer, a version of Meshlab (http://meshlab.sourceforge.net) developed to support offline and unattended geometry processing.

Different templates have different purposes. The basic viewer, standard viewer and fullsize viewer are viewers with different characteristics that can be used for the plain visualization of the uploaded model.

When the user wants to obtain more than a plain visualization but wants also to visualize information associated to the input model, the Metadata Browser template is the one to use. This application template is able to setup in an integrated interface the viewer plus the model information. In this case the user should provide the desired information as an additional metadata file in XML format.

For an example and showcase, you can refer to Deliverable 5.3

The Radiance Scaling template demonstrates a successful example of integration between different components developed in the framework of the V-Must project. Radiance scaling is a visualization technique aimed at improving the detail perception of the rendered 3D object. This application template converts the model into an X3DOM format and setup a web page containing a viewer that employs a proper implementation of the radiance scaling visualization approach. This is particularly useful when the user wants to visualize the uploaded model in a way that enhances its surface details.

The Walk Through template is specifically designed for all models where navigation/exploration should happen inside the 3D object and not around (navigation inside the object rather than seeing it from the external space). For example, this is particularly suitable to show the model of an ancient city or the model coming from the acquisition of an area of interest like an archeological tomb.

The Nexus conversion, that is the last application template, differs by the others because it does two services at the same time. In this case the uploaded model is converted in a Nexus 3D model format, that is a multi-resolution format [4] developed by the Visual Computing Lab of the ISTI-CNR. Then, this nexus model is put inside a web page prepared using the 3DHop technology (see the following subsection for a description) to allow its streamlined visualization through the Web. So, this template is particularly useful for the visualization of high-resolution 3D models. Moreover, the converted model is returned with the web page, so that the user can employ it also in other ways using the mentioned 3DHOP framework. Hence, this template can be used also to obtain a Nexus model for different applications providing an input model in PLY format.

4.2.4 Blender Farm

(S. Imboden, CINECA)

A Blender-based rendering farm services will be integrated the same platform of HPC-Forge, as described in deliverable 4.3b.
The core of this service has been modeled for APA movie production and consist mainly in a web interface that allow the render manager of the project (or any user allowed) to submit batch jobs on a cluster resource to allow for rendering of movie shots from a (Blender) defined scene already stored in a SVN repository.

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The current interface is tailored on APA structure and leverage on CINECA resources but it should be easily extensible to other Blender-based movie projects.

As this type of projects require a substantial amount of computing resources, care must be taken to properly allocate and account resource usage.

4.2.5 Community Presenter – 3D Hop

The new version of the Community Presenter, accessible through the Portal is 3DHOP

3DHOP (3D Heritage Online Presenter) (http://vcg.isti.cnr.it/3dhop) is an advanced technological solution for easy publishing 3D content on the Web. This tool allows the creation of multimedia presentations of digital models directly inside an HTML5 web page (no plug-in needed). The 3DHOP technology is a set of pre-configured viewers able to manage online one or more high-resolution 3D models, permitting the users to interact with them. This technology is focused on Cultural Heritage applications, where we often need to handle highly detailed digital representations of the artifacts (usually produced with 3D scanning or 3D sampling technologies), without preventing however to use it in any other context in which high performance in the interactive visualization of 3D content is necessary.

Figure 1. A museum application developed using 3DHOP for the Museo dei Bozzetti in Pietrasanta, Lucca (Italy).

3DHOP is developed by the Visual Computing Lab of ISTI-CNR, and it has been designed on the base of previous experience in presenting customized 3D content for CH applications, such as the Virtual Inspector systems [5] and the Community Presenter, the latter developed in the EC IP "3DCOFORM: Tools and Expertise for 3D Collection Formation" project. Hence, 3DHOP can be

seen as the new version of the Community Presenter with an architecture and features re-designed to deal specifically with online web applications.

The 3DHOP has been developed thinking to be given in the hands of general users, which should not be expert on Computer Graphics or Web programming, and to be easy-to-use and easy-to-learn. The target audience ranges from the museum curators with some IT experience to Web designers. To reach this goal 3DHOP uses declarative programming and makes an extensive use of pre-defined templates. This means that to use it a user should just select a template example and simply modify it, filling some specific text fields with the right variable values. Additionally, its modular structure facilitates the advanced users to perform more in-depth modifications to add functionalities.

From a technology point of view, 3DHOP is based on HTML5, JavaScript and WebGL (through SpiderGL, (http://spidergl.org) [6], a JavaScript library designed to support the development of advanced online graphics applications). In this way it can work in all the most widely used browsers (Chrome, Firefox, Opera and, recently, also Internet Explorer) and on all the main OSs (Win, Mac-OS and Linux) without the use of additional plugins.

The model formats for 3D content actually supported by 3DHOP includes PLY (.ply) and NEXUS (.nxs), used respectively for fixed and for multi-resolution 3D models. The Nexus technology (http://vcg.isti.cnr.it/nexus) [4] is the one that allows the streaming of multiresolution 3D meshes over HTTP, supporting the navigation of very large models (millions of triangles) also on commodity computers with standard internet connections.

A first integration of 3DHOP in the CIF is represented by the Nexus conversion application template just described in the Model Convert section and it is described in Deliverable 5.2 and 5.3.

4.2.6 Instant Reality framework access

(H. Graf, FHD)

(http://www.instantreality.org/) is a platform independent Mixed Reality framework implemented in C++, which is developed at Fraunhofer IGD and utilizes the open ISO standard X3D as application description language. It provides tools to better understand and optimize large 3D data sets. One such tool is the command line tool **aopt**, which can transcode and optimize 3D models with a special focus on scene-graph data. In this regard, we also further improved aopt to better cope with the limitations of Browser-based 3D visualization (like the 16-bit limit of index arrays which e.g. requires mesh splitting). To ease usage, we have also written a little online tutorial showing how to use aopt as a standalone tool: http://x3dom.org/docs/dev/tutorial/aopt.html

4.2.7 OpenSceneGraph framework access

What is OSG framework access?

OSG (OpenSceneGraph) framework access, is a software product that provides a suite of Server-side services for virtual 3D scenes (scene-graphs) and 3D collections.

How does it work?

OSG framework access offers two main subsets of services:

Web Processors: is collection of dockable web components (PHP + OpenSceneGraph) able to process data and automatize frequent osg-based tasks:

- Remote Terrain Generator (remote VPB)
- Segmenter (organization of large 3D data)
- Optimizer
- Instancer: procedural generator to populate a 3D scene with scientific validated data

Scene Composer: a set of services (client and server-side) for online compositing and publishing of complex 3D hypotheses (scene-graphs) starting from shared 3D collections

- services to access 3D collections
- services to access 3D scenes
- 3D annotations and measurement tools
- based on PHP, OpenSceneGraph and ownCloud (LAMP server)

4.2.8 Metadata Editor

Metadata Editor is a web application for entry of metadata in production stage. It is critical that metadata on multimedia content is collected at soon as the content is generated. To this purpose, a user-friendly web interface is provided that allows metadata entry and review to content creators and repository managers. Metadata Editor gives a visual hint on outdated and missing metadata, and provides a simple filesystem-based approach to metadata inheritance.

Metadata Editor is developed using Python, Django and Bootstrap.js. It can be used either as a standalone application or integrated as module into HPC-Forge. Current version of Metadata Editor assumes that project management and user permissions will be handled within HPC-Forge, so there is currently no interface for project management within Metadata Editor itself, however it should be fairly simple to create one. Such interface would have to be disabled in an HPC-Forge installation to prevent abuse.Metadata is associated to filesystem entries (files and folders), although it is possible to enter metadata not related to files (persons, time periods, licenses etc.)

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Metadata for one file may include a reference to other metadata (file or non-file based). There is also a web interface to specify schemata. All metadata is stored in a database for faster and simpler processing, but Metadata Editor also provides ability to export and import metadata via XML. Currently under development is support for import and export of schemata in standard formats.

To properly connect metadata to files, Metadata Editor needs access to listing of all files on a given project as well as a way to track changes to those files (additions, deletions, modifications etc.) Currently there are two ways to achieve that: as a local folder on the same server that hosts Metadata Editor, or using Subversion (SVN) protocol. In latter case, the SVN server may be located remotely. Under development is support for remote files using WebDAV protocol and support for OwnCloud.

The source code of Metadata Editor is hosted at HPC-Forge installation at Cineca (https://hpc-forge.cineca.it/), and all development is done using that server.

4.2.9 E-learning services

The e-learning service has been developed using Moodle, a robust LSM Learning Management System solution (see deliverable 6.4b).
The Moodle framework is hosted and managed at Cineca. Moodle (http://www.moodle.org) is a free, open-source PHP web application for producing modular internet-based courses.
It has been tested during the Italian Virtual Heritage School: Virtual Archaeology & Computer Graphics 2012; German Virtual Heritage School: AR, APP and VR 2012; 8th Advanced School of Computer Graphics and Cultural Heritage 2012; International Virtual Heritage School - virtual museums, communication and digitization 2012; Italian Virtual Heritage School: Virtual Archaeology 2013; Scuola di Grafica 3D per i Beni Culturali Progetto Portici Unesco 2013. All the courses are accessible by registered users.
Starting from 2013 the L2L service, has been integrated within the platform a service provided by Cineca as well. L2L allows live lectures to be semi-automatically transformed into e-learning activities ready for publication and delivery through the Moodle e-learning platform. It has been realized using a Digital Asset Management (DAM) system based on the open source platform MediaMosa, which has been integrated into Moodle with a special plug-in (see deliverable 6.4b). A course about the Key to Rome experience will be uploaded on the Moodle platform with L2L presentations and other educational material and an open access will be granted in order to

better disseminate V-Must expertise.

4.2.10 Archiving services

This service in progress is described in Deliverable 4.3b

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5. ANNEXES

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