

# A vision for supporting future VPH activities through resources developed within the VPH network of excellence

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## Introduction

The VPH network of excellence (NoE) aims to “help support and progress European research in biomedical modelling and simulation of the human body”[1]. Consequently, the NoE has developed a number of resources and outputs to support a range of VPH activities and their underpinning technologies. For the final year of the project (up to Nov 2012) these NoE outputs are being brought together through a unified resource, capable of supporting and informing future VPH activities beyond the lifetime of the project. This takes the form of a VPH-NoE web portal, encapsulating VPH-NoE outputs, but incorporating extensibility and longevity that ensures its continuing existence as a focal point for wider VPH activities.

This report outlines the work that is currently being performed to develop the VPH-NoE web portal including a description of the proposed goals and developmental strategy, an overview of proposed NoE content and a summary of current progress.

## Materials and Methods

### *Developmental Strategy*

The purpose of a web portal is to bring multiple web and locally hosted resources together, available through a single point of access. Web portals provide a unified interface for the amalgamation of disparate sets of web content, thus facilitating collaboration and the sharing of tools and knowledge across an organisation or large collaborative project, such as the VPH.

The NoE portal aims to expose all NoE member outputs and resources so that NoE and VPH activities can be promoted as a technical reference resource for the VPH community. A principled approach to content integration across the spectrum of VPH activities has the potential to deliver numerous advantages.

A multi-phase development process has been adopted, with initial work focusing upon evaluations of candidate technologies suited to portal implementation. Simultaneously, NoE members have been consulted regarding their expectations and suggestions for proposed portal content and a review of project outputs compatible with the portal has been undertaken.

To understand the concepts driving the development process, it is useful to appreciate the different levels of portal integration that are being considered for portal design. These are listed below:

**Knowledge base** - The minimum requirement for inclusion of material within the portal is simply to describe the project and link to it as an external resource. This may form part of a knowledge base, supported through wiki-like community upkeep, as well as technical support of automatic link checkers and local archiving of mirrored websites.

**Embedded webpage** - An external project webpage may be embedded in a portal frame, using for example the *iframe* tag. Ideally the webpage would have a minimal design specifically for inclusion in the portal, although this is not strictly necessary.

**Content aggregation** - Content aggregation creates value by bringing together multiple live feeds of news and other information into a central resource, with no ongoing administrative overhead. News syndication is already widespread on VPH project sites using the RSS protocol, and syndication of calendar events using the *iCalendar* protocol is also envisaged.

**Javascript widget** - A common approach to exposing web services is to provide a javascript *widget*, to be included within a portal window. Widgets are being considered and may access the social data of a host portal by using the OpenSocial API.

**Java portlet** - For seamless integration of other portals within the NoE portal (and potentially with other embedded portlets), project partners may provide a Java portlet. This runs on the portal server itself, but may access remote data via web services. Such portlets would be developed and tested within the project teams before being installed in the portal, after being tested in a ‘sandpit’ area. However we intend to work on a portlet with an NoE partner as a case study, acting as an example of this approach for other projects.

**Secure shell/VNC** - Although the portal is predominantly targetted at web based tools, knowledge and data, many traditional and useful command line and GUI tools exist which are not exposed on the web. Where it is useful to provide access to these tools alongside web tools, we may do so using Java applets which run command line and GUI tools within a portlet.

The above techniques offer different ways of bringing content and tools together into a central resource. We now review the proposed content.

### **Proposed Content**

The content aggregation process will progress and expand over agile cycles of development and assessment. The following list gives a summary of a number of data sources that have been identified as providing valuable content for integration with the portal:

**General Information** – This represents the existing pool of information regarding the VPH-NoE project and the wider VPH community. It includes descriptive content, related websites, an aggregation of relevant news feeds and a directory of web links relevant to the VPH community.

**Collaborative tools** – This includes a range of activity including private document sharing, ‘wiki’ community maintained content, live discussions and forums.

**The VPH NoE Toolkit** – This resource is a web based catalogue of available research tools for supporting VPH project activities. Information describing 96 distinct tools is currently included, with expectations of significant increases by Sept. 2012.

**The NoE toolkit guidelines** – This refers to a set of reports that have been written to advise the VPH community on best practise regarding specific issues related to tool development. They include guidance documents on tool, model and data characterisation, ontological annotation, interoperability, ethico-legal issues, licensing and usability and training.

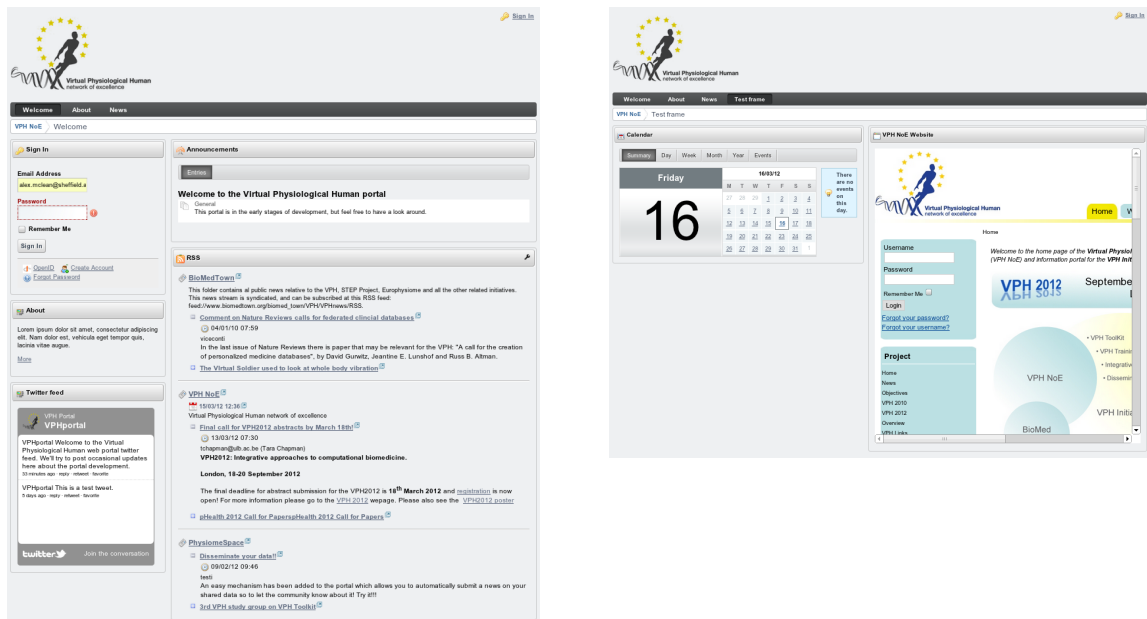
**Exemplar projects (EPs)** – The VPH-NoE has commissioned 12 EPs, typifying VPH activity and targeting common issues such as data standardisation, annotation and model interoperability. Each project presents an interesting case study capable of informing and complementing the work of future VPH projects.

**NoE clinical education resources** – This includes content related to the VPH-NoE Education Engine including virtual patient development methodologies, supporting documentation and links to view the developed virtual patients from directly within the portal.

### **Results and Discussion**

A range of candidate technologies have been assessed, and the Liferay portal software[4] has been chosen as the ideal solution for NoE portal development. It is well documented, fully portlet standard compliant [3], allows easy redesign, includes advanced content management, and supports all the approaches to project integration listed above. Furthermore it is open source licensed, and so benefits from advantages of adaptability, longevity and community support.

A live portal has already been installed as a prototype with basic functionality. This is being used as a basis for eliciting project partner feedback. A rich set of content data sources has been identified, and is being prepared for inclusion through incremental prototyping.



**Figure 1: Screen shots of the live prototype portal available at <http://vph-portal.shef.ac.uk/>. The left hand screenshot demonstrates news aggregation, and the right hand embedding of external websites in the portal, in this case <http://www.vph-noe.eu/>.**

## Conclusion

Significant progress has been made towards creating a portal for aggregation and access to VPH NoE resources and outputs. The adopted approach offers flexibility and is strongly expected to realise the goals of the VPH-NoE portal initiative, providing a valuable resource for the VPH community beyond the lifetime of the VPH-NoE itself. Through community based support and expansion, the portal has the potential to act as a set of way markers for newcomers, a focal point for VPH dynamic collaboration activities and offers a configurable dashboard interface for VPH community members that need a central online space for linking-in their VPH data and tools.

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## References

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