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## **Virtual Research Environments: Issues and opportunities for librarians**

Judith Wusteman

### **Abstract**

**Purpose** This editorial introduces a special issue of Library Hi Tech on “Virtual Research Environments: Issues and opportunities for librarians”. It defines the concept of the Virtual Research Environment (VRE), describes its relationship both to the Virtual Learning Environment and to Web 2.0, and proposes that librarians play a central role in VRE development and use.

### **Findings**

The Virtual Research Environment is likely to have a huge impact on many aspects of research and, thus, on the role of the academic and the research librarian. If VREs are to fulfill their potential as useful and usable artifacts, librarians need to have a central role in their development and application.

### **Practical implications**

Librarians need to be proactive in identifying and advocating for their potential roles in VRE development and use. These roles need to be taken into account in the curricula of schools of library and information studies.

### **Originality/value**

This is an ideal time for librarians to explore the potential of VREs because there is still time to influence their eventual form.

**Keywords** Virtual Research Environments; librarians; Virtual Learning Environments;

**Type of paper** Viewpoint

### **Librarians and VREs**

The Virtual Research Environment, or VRE, is a relatively young concept and is still making the transition from research topic to real-world product. It has begun to appear on the radar of a small but increasing number of librarians and, to a lesser extent, researchers. The VRE is likely to have a huge impact on many aspects of research and, thus, on the role of the academic and the research librarian. If VREs are to fulfil their potential as useful and usable artefacts, librarians need to have a central role in their development and application. Whether librarians are facilitated to make this contribute depends, in part, on whether they are proactive in identifying and advocating for their potential roles.

To support this end, this special issue of Library Hi Tech presents six papers on a wide-range of topics concerning VREs. It begins with an article by Voss and Procter (2009) that investigates the implications of the emergence of VREs and related e-Research tools for scholarly work and communications processes. This is followed by Sonnenwald *et al* (2009) who present current and ongoing research investigating new ways of working across geographic distances and time within Library and Information Studies (LIS). Dunn (2009) then reviews the concept of the VRE in the light of its development over the past

five years, and assesses its applicability to the arts and humanities disciplines. Masson (2009) discusses how the changes to library services that arose from the institutional adoption of Virtual Learning Environments may influence the development of VREs. Myhill *et al* (2009) consider the potential use of web 2.0 tools as the basis for the creation of a VRE. Finally, Candela *et al* (2009) discuss the concept of “on demand” VREs and their potential implications for the role of librarians.

## Defining the VRE

What exactly is a VRE? An early definition is still widely quoted:

“A set of online tools and other network resources and technologies interoperating with each other to support or enhance the processes of a wide range of research practitioners within and across disciplinary and institutional boundaries.” [1]

As Voss and Procter (2009) emphasise in this special issue,

“The aim of a VRE is to provide an *integrated* environment that supports the work of a community of collaborating researchers. That is, a VRE brings together previously separate tools needed for conducting the research and for *collaboration*, support for which is increasingly recognised as an integral aspect of researchers’ work rather than something that can be added on as an afterthought.”

Definitions relating to VREs and analogous technologies are fluid and can be vague. Voss and Procter (2009) suggest that VREs, collaboratories, cyberenvironments and science gateways can be defined as synonymous. However, the latter term could also refer to the simpler concept of a web portal. There is already evidence that misuse of terms is creeping in. A prime example is the increasing tendency to describe digital libraries as VREs, or more commonly, collaboratories; this needs to be guarded against. The VRE is much more than a digital library, or even a portal to a range of digital libraries.

As Dunn (2009) comments, the term Virtual Research Environment has yet to permeate the “mainstream academic community”. But, although the VRE as an entity is relatively novel, the concepts that it incorporates are far from new. Various other related technologies, such as collaborative (or virtual) research communities, Web 2.0 tools and e-Research tools may constitute VREs or may be potential components of a VRE. To this end, Dunn describes Google Earth as a useful illustration of “what a VRE is not”. On the basis that Google Earth is an online environment with potential applications, it can be a very useful component of a VRE - but it is not a VRE *per se* because there is no mechanism for managing or authenticating users, the user does not have ultimate control over the data, and there is no focus on a particular question or topic (Dunn, 2009).

## “Those who do not know history...” (Mackie, 2009)

Virtual Learning Environments (VLEs) are now widely used in higher education and are frequently interoperable with the e-information environment provided by university libraries. Whereas VLEs concentrate on the provision of teaching and learning functionality, VREs emphasise the provision of analysis and research tools. However,

there is some overlap of functionality between VLEs and VREs, in particular in the provision of administrative and management features. Several of the papers in this collection refer to VREs' roots in VLEs. In particular, Masson reviews the impact of VLEs and asks what lessons can be learned for VREs.

The common origin and complementary nature of VREs and VLEs can hide some fundamental differences between the two concepts. The JISC VRE programme has highlighted one of the major differences: while there is considerable commonality between VLEs, VREs can differ widely in their requirements depending on the discipline they support; thus VREs require the development of considerably more bespoke technology (van Till, 2009). However, it is yet to be demonstrated whether this is a permanent situation or just a side-effect of VREs being at an early in their development life-cycle. Different disciplines may have different priorities: a given feature may be low priority for one discipline and high priority for another, but ultimately useful for both.

Despite these and other differences, the overlap with VLEs can offer a natural entry point to VRE activity for librarians. Just as librarians have played a pivotal role in the management and optimal use of VLEs, so they can make a real contribution to the evolution of VREs. Librarians can contribute not only the lessons learned from VREs but also an insight into many of the central issues that will be involved in VRE development, including information access and curation and discipline-based knowledge (Wusteman, 2008).

This having been said, if librarians are to develop their role in VREs, then further training in topics such as data curation will have to be provided. Indeed, Candela *et al* (2009) suggest that librarians involved in e-Science will have to "rethink their profession." This will necessitate changes to the curricula of schools of LIS (Swan and Brown, 2008). Thus, if library education is to be research-led, VREs need to be promoted as a topic of LIS research. However, in this special issue, Sonnenwald *et al* (2009) comments on the lack of research into the impact on LIS research, education and practice of VREs and related concepts and technologies.

## **Web 2.0**

Web 2.0, or the Social Web, is revolutionising the way we interact with information and with one another online by "harnessing [the] collective intelligence" of Web users (O'Reilly, 2005), thus facilitating community, dynamic collaboration and the sharing of ideas. The momentum of academic research could benefit enormously from adopting Social Web ingenuity and functionality. This is increasingly being recognised by the research community in a swathe of new projects, for example, the national UK centres for both e-Science and E-Social Science have recently initiated projects evaluating the impact and relevance of Web 2.0 for researchers and e-Research infrastructure [2, 3]. Another example is the Science Foundation Ireland OJAX++ project, which aims to investigate and illustrate how concepts from the Social Web can be applied to the research environment via the creation of a Web 2.0-based VRE [4]. Similarly, the JISC-funded MyExperiment project describes itself as developing a "Web 2.0 VRE" [5].

The potential of Web 2.0 to profoundly change higher education has been recognised (Franklin and van Harmelen, 2007). VLEs preceded Web 2.0 but a new generation of VLEs are now adopting some of the principles of the Social Web. VREs, on the other

hand, are evolving in the Web 2.0 era and so can take advantage, not only of lessons learned from VLEs, but also of lessons learned from the Social Web. This is reflected in the coining of the term “Research 2.0” which refers to “the extension of Web 2.0 tools to support academic and other research” (Lin 2008, p. 3). In this special issue, the application of Web 2.0 to VREs is addressed by Myhill *et al* (2009) who argue that a VRE based on Web 2.0 technology “is not only viable but a certainty” and go on to consider the merits of using Web 2.0 tools to provide the key components of a VRE.

### **From theory to practice**

In 2007, over half of UK researchers interviewed had never heard of VREs; a further 31% had heard of VREs but knew little about them (Swan and Brown, 2007). This is mirrored by a small Irish study (Rock, 2008) that found that few researchers had heard of the term VRE and most were unfamiliar with the concept.

However, academics are becoming familiar with social networking tools, as evinced by an increase in their use from 3 or 4 % in 2006 to 25% in 2008 (Brynko, 2008). Collaboration tools are an important component of VREs; the academic’s increasing familiarity with social networking technology will be helpful in encouraging uptake of VREs. It doesn’t matter whether researchers identify the integrated environment of tools they are using as a VRE, so long as it is assisting them in their research.

Librarians, on the other hand, need to be able to recognise a VRE when they see one because they should be drivers of the technology. And it is clear that librarians are increasingly identifying the VRE as an important concept that they need to investigate [6]. Now is the ideal time for librarians to explore the potential of VREs because, at this stage of their development, there is still time to influence their eventual form.

### **Notes**

[1] Virtual Research Environments Programme: Phase 2 roadmap:

[http://www.jisc.ac.uk/publications/publications/pub\\_vreroadmap.aspx](http://www.jisc.ac.uk/publications/publications/pub_vreroadmap.aspx)

[2] The Influence and Impact of Web 2.0 on, e-Research Infrastructure Applications and Users: [http://www.nesc.ac.uk/esi/themes/theme\\_12/](http://www.nesc.ac.uk/esi/themes/theme_12/)

[3] The use and relevance of web 2.0 tools for researchers:

<http://www.ncess.ac.uk/news/item/?item=105>

[4] OJAX++: <http://www.ucd.ie/wusteman>

[5] MyExperiment: <http://www.myexperiment.org/>

[6] For example, a “Libraries and Collaborative Research Communities” theme is being introduced in 2009’s Digital Libraries à la Carte (Ticer, Tilburg University):

<http://www.tilburguniversity.nl/ticer/09carte/>

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