Virtual Research Environments – Catalysts of Change
Report on Knowledge Exchange workshop in Birmingham
17 – 18 November 2011

Summary
On November 17 and 18, Knowledge Exchange organised a workshop that brought together 34 experts in Birmingham to explore the potential of Virtual Research Environments (VREs). Drawing from experiences of the last seven years in a variety of projects, the discussions provided valuable insights into how VREs can integrate more fully in the research infrastructure, both organisationally and socially. Such questions were addressed as what changes do they bring about and what changes do they presume.

Through a keynote presentation on the developments at SAKAI, breakout groups, a five minute madness and a poster session and a panel discussion a wide range of developments was exchanged and various shared interests were addressed. Participants expressed that they were very pleased to have this platform to exchange experiences across their national boundaries in this rapidly developing field.

Notable outcomes from the workshop were:

- **VRE’s are not ‘one thing’:** they can vary in shape, size, goal and use, and we therefore need to bring together a variety of perspectives and solutions to exploit the full potential of the phenomenon.

- **Case studies – of successful and failed projects –** are needed in order to gain better understanding of researcher’s behaviour, and the way it is affected by the use of VRE’s. Better ways are required to reach particularly young researchers, who tend to rely on their peers network rather than institutional support. Through the case studies the value and impact of VRE’s can be explored, and this should help identify the factors that influence use and success.

- **Insights from such case studies will help to support community networks in the development and implementation of VRE’s and resolve sustainability issues more easily.** The insights can also be used to inform policy makers and funders about effective policy and financial support. There was a strong agreement that Knowledge Exchange is well-situated to play an important role in these knowledge developing and sharing activities to integrate VRE’s in the research infrastructure.

Programme of the meeting
The meeting kicked off with a keynote speech\(^1\) by Ian Dolphin, executive director of the Sakai Foundation which offered inspiration for the breakout groups. These groups explored the following three topics: Researcher behaviours, creation, policy development and business models of VREs and developing a ‘VRE community’.

In a series of ‘five minutes madness presentations’\(^2\) a wide variety of VRE-projects and initiatives presented themselves at the end of day 1. In an animated poster session, participants had a chance to learn more about a number of those projects. Day 2 started with a panel discussion which highlighted a number of critical issues and raised important questions regarding VRE’s. These were taken up in the second round of breakout sessions which were summarised and presented at the close of the workshop.

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Keynote speech

Drawing from his experiences with the development of Sakai, Ian Dolphin raised a number of important issues that have caused a change in thinking about virtual research and education environments. He pointed to the lack of early-stage institutional ‘ownership’; the tendency to focus on technology rather than on communities; and how research group involvement proves to be a double-edged sword. These groups tend to be project-focused which has consequences for sustainability once the project funding ceases. He also mentioned some larger questions resulting from experience with VRE’s:

- does ‘productisation’ of VLE/VRE’s not freeze innovation – there seems to have been a tendency to ‘tick the box’ and say that ‘we have a product in place’;
- how many different environments do practitioners need; are the differences not enhanced by the existing policy and funding silos;
- is the closed group using the environment stimulating interdisciplinarity as much as the technology enables it?

The vision on support of research collaboration has shifted. The rapid changes in the policy context and the awareness of the global nature of academic collaboration and discourse have shown that we need to think on ‘web-scale’ rather than ‘enterprise-scale’. We have an ‘unprecedented capacity to share’ so how can it be realised to its full potential? The movements towards open access, open data, open source software are responses to this question. These are not just ideological responses, but also very practical ones, because they open up the possibility to focus more on what research and teaching really need. They allow research and higher education to take it into its own hands. Apart from this, the need to innovate is an important driver, and the role of networks is very important in stimulating innovation.

Sakai is responding to this changing context with their new Open Academic Environment. This is a more flexible and extensible platform which allows for networking of people which are not necessarily members of one group. It also offers flexibility through the ‘re-use’ of components and tools, uses open standards and adapts social networking to fit the academic environment.

Of course, questions and issues remain. It will be important to look beyond individual projects, developments like this are not a one-time effort that will get easier at some point. Furthermore, academic networking concerns a confluence of different areas of work. The question is whether we are connecting the different strands of activity appropriately. Interoperability is an important issue that needs a lot more practical testing. Finally, in this highly fragmented space of work, we need an exchange of experience and practice, preferably with a broader audience; the Knowledge Exchange does, can and should play an important facilitating role here.

Breakout sessions

The breakout sessions led to lively discussions on the three topics; the following summaries are based on the final plenary reporting at the end of the programme.

Breakout session 1: Researchers’ Behaviour
The discussion was kick-started by Julie Carpenter’s presentation on the ‘Researchers of Tomorrow’ project funded by the British Library and JISC. Subsequently, the group looked

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3 Quote from David Wiley
at examples of how VRE’s are changing. They also addressed how they may change research practice and identified several success factors:

- someone to sit down at the desk of researcher and help them understand what is possible, similar to the function performed by learning technologists
- connecting, but not mixing, personal and collaboration spaces
- seamlessness around different tasks
- a common interest in data is important but not leading; the community aspect is leading
- building the environment is not enough to build a community
- be sensitive to the fact that PhD students like to network and communicate, but not necessarily share their research findings before publication
- provide ‘personal pages’ providing expertise and contact details, photos, etc.

It was emphasized that VRE’s can be used for a wide spectrum of activities and interests; some are concentrated on communication, others on the collection and collaboration on data. A VRE may only serve a research group, or may have to connect with large groups outside the institution. All these varieties in use require their own composition of services in order to achieve the goal of the VRE. The broad variety also clouds the understanding of what a VRE is. Furthermore, it was noted that the question how to realise optimum use of the potential of technology is not an issue exclusive to academia: it is a generic issue across organisational life.

The discussion also made it clear that professional support for researchers in (the discovery of) the use of technology is not yet sufficient and needs to be extended and improved. The role and its importance should receive more recognition. The question is who could take up this role, there might be a role for research libraries to play in this. It is also important to learn more about success factors for (the uptake of) VRE’s. PhD students are seen to pick up technology easily when its benefits are immediate; the question is whether VRE’s do not offer such obvious benefits. Perhaps communication about them needs to improve.

It was pointed out that students and researchers do tend to go for the freely available and easy to use tools and services, whereas institutions offering VRE’s provide a safer and more sustainable environment. It might be worthwhile to investigate whether the gap between the two can be bridged.

Breakout session 2: Policy Development, Creation and Business Models of VREs

In the second breakout group sustainability was a major topic in the discussion, fuelled by Jim Farmer’s presentation on the topic. Jim’s definition of sustainability included the principle of ‘the user pays’. In the discussion it was raised that this would create challenges for fundamental research and ‘poor’ communities. Different funding models were compared, including some from Open Source Software (OSS) development. Examples are funding by companies with a vested interested in development and maintenance of the software, or income from membership fees or contributions of effort.

The OSS experience emphasizes the importance of taking sustainability into consideration from the moment the funding application is written; OSS Watch has developed a template that helps to consider sustainability issues throughout the project’s process. The advantage is that the question gets dealt with explicitly – also in the case where sustainability is not required. There was a discussion whether researchers are

Fig. 4: Conclusions group Researchers’ behaviour

Christian Wolff, University of Regensburg: The phenomenon – of slow adoption of innovation – has been there since the 18th century
best placed to think up business models, and whether they should be dealt with at individual project level at all. In Germany, an effort is made to structurally position VRE’s as a bridging mechanism between research and infrastructure and divert some of the existing two funding streams to VRE’s. Lastly, it was stressed that sustainability does not equal funding: issues such as organisation, content, techniques need looking into as well. The main question about policy was whether it should or could be enforced and whether it could encourage researchers to use VRE’s. One suggested approach was not to recommend researchers what to use, but warn them about the risks involved in the use of (free) tools on the net. A further suggestion was to collect case studies about successful VRE’s. First of all, because researchers want to engage with infrastructure if they see examples of other researchers using it that seem inspiring. Secondly, to demonstrate the benefits and factors that contribute to sustainability. For the latter reason, stories about failed VRE’s are also needed. Also valuable would be stories about failed funding applications. This would provide information on what needs to be discussed with funders to support the development of this type of infrastructure. The list of questions used in this breakout group could be used as a guide in collecting case studies.

As criteria for ‘successful’ VRE’s, the following were listed:

- (Re-)use
- Level of community engagement and development
  This will determine (re-)use to a large extent.
- Productivity
  Does the VRE help the researcher to work more effectively/efficiently?
- Attaining goals
  Has the VRE helped to realise the researchers’ goal?
- Meeting obligations
  Has the VRE helped researchers to meet their obligations (towards their institute or funder)?

Breakout session 3: Community Networks

The third breakout group looked at how the potential re-use of tools and functionalities within VRE’s could be realised. The exchange of ideas and experiences led to a proposal to be taken forth. The most important obstacle mentioned for the re-use of tools is the lack of proper documentation. In this respect, a ‘VRE Development Community’ can be of great value, because it offers the opportunity to gather, publicize and update information, share the lessons learned and the solutions found in those projects.

The Knowledge Exchange partners, as funding bodies, can play an important role here. They can oversee what is being developed and work towards avoiding overlap when considering proposals. They can also specify what information needs to be provided about a project, and provide a standard tool or form to make submission of that information easy. This can be embedded in the project management process.

When looking at re-using a VRE there is often more interest in a specific element and not the VRE as a whole. In order to meet this demand, rather than offering information on an entire VRE, a VRE could be shown with its elements. An interesting way to visualise a project and its elements would be by using the format of an aggregated map. This offers more insight into the elements which then can be reused.

Another option to ensure that projects comply with the ‘information obligation’ without making it too laborious, would be to let them report during a meeting at a central location and record the reporting.
Information on deliverables, tools and functionalities could form part of a knowledge base; and this could be taken up as an activity by KE. There are more parties who could do this, or add to this. It would be very useful to have information from US projects as well. The KE would be a good starting point and could work towards expanding once the basic knowledge base for its four partner countries has been set up.

**Figure 6: Discussion during the poster session**

**Conclusion**

In the final session the breakout groups presented their conclusions. The participants expressed their satisfaction in the workshop. It offered them a unique platform to discuss developments in VREs across national boundaries and share their experiences. The presentations and the discussions showed that the development and implementation of VRE’s as part of the research infrastructure are still in their early days. Adopting, using and re-using, and sustaining the VRE are complex matters. Encouraging sustainable use and re-use requires a better understanding of the functioning and impact of existing VRE’s. An aspect in this is to bridge the gap between the VRE as a technical instrument and the demands of the researcher. It is not clear who will take up this role.

One conclusion was that it is important to gather ‘stories’ of successful and failed projects, to gain such understanding – about the VRE’s as well as about the researchers that use them. These insights are needed to help the practical implementation of VREs. The insights are also valuable for informing funders and policy makers and would help provide insight into the required support.

Another important conclusion is that with the variety of possible uses of VRE’s we need a variety of perspectives and solutions to exploit the full potential of the phenomenon. Knowledge Exchange has an important role to play as a platform for sharing experiences and information. It could take action by building a knowledge base and by informing policy. This would really support the further development of VRE’s as part of the research e-infrastructure, if they are truly to become catalysts of change.