



## D3.3 Community delivery and evaluation

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e-infrastructure

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## Introduction

Scratchpads, ViBRANT's central hub where services are linked together, are an open source Virtual Research Environment supporting scholarly collaboration, communication and data publication in biodiversity science. Their purpose is to help researchers to work collaboratively by managing the increasingly complex range of tasks involved in carrying out research on both small and large scales. Scratchpads allow for handling biodiversity related data from the collection and generation stage to the online curation, analysis and publication.

Since its launch in 2007, a logarithmic growth in both the number of sites and the number of registered, active users has been observed.<sup>1</sup>

This document explains how the investment in putting in place the necessary support mechanisms, the development of a network of Ambassadors, the analysis of the user communities as well as the assessment of the needs of users are major factors leading to a successful and sustainable implementation of Scratchpads as an open source Virtual Research Environment. Mechanisms to increase user uptake were detected and suggestions for potential user groups and audiences for Scratchpads are given.

## Support and outreach structures in Scratchpads

In order to facilitate the use of Scratchpads among users, support is provided through multiple channels and a diverse set of tools have been implemented<sup>2</sup>:

- [training](#) on-site and online is provided to help current and prospective Scratchpads users to develop site building skills and to guide them through major Scratchpads features;
- through [Redmine](#), an open source project management system, the support team tracks all bug reports, feature requests and support queries posted by the users;
- documentation is provided through a [Help Wiki](#);
- answers to the most frequently asked questions about Scratchpads are found in [FAQ](#);
- to experiment with Scratchpads features the [Sandbox](#) can be used;
- extensive testing can be done through a [training site](#);
- and an extensive worldwide [network of Ambassadors](#) has been established to support local Scratchpads communities.

The established support systems and their sustainability post-ViBRANT are discussed in detail in 'M3.16 Established user support services to keep the open source network community alive and vibrant'.<sup>3</sup> The report outlines that in a community based open source and modular model such as Scratchpads crowdsourcing the user support activities and maximizing the efficiency of the existing support structures are important in contributing to a successful and sustainable open source networking community.<sup>4</sup> Obviously technical maintenance is of equal importance.

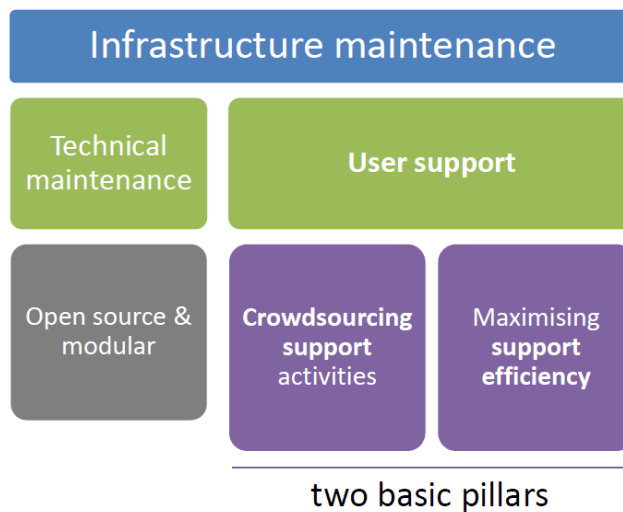
<sup>1</sup> <http://scratchpads.eu/explore>

<sup>2</sup> <http://scratchpads.eu/support>

<sup>3</sup> [http://vibrant.eu/sites/vibrant.eu/files/M3.16\\_Established\\_user\\_support\\_services\\_DEF-121113.pdf](http://vibrant.eu/sites/vibrant.eu/files/M3.16_Established_user_support_services_DEF-121113.pdf)

<sup>4</sup> [http://conference.lifewatch.unisalento.it/ConferenceContents/BIH2013\\_Presentations/Thursday%20PM/Koureas\\_050913PM.pdf](http://conference.lifewatch.unisalento.it/ConferenceContents/BIH2013_Presentations/Thursday%20PM/Koureas_050913PM.pdf)

## Community based sustainability model

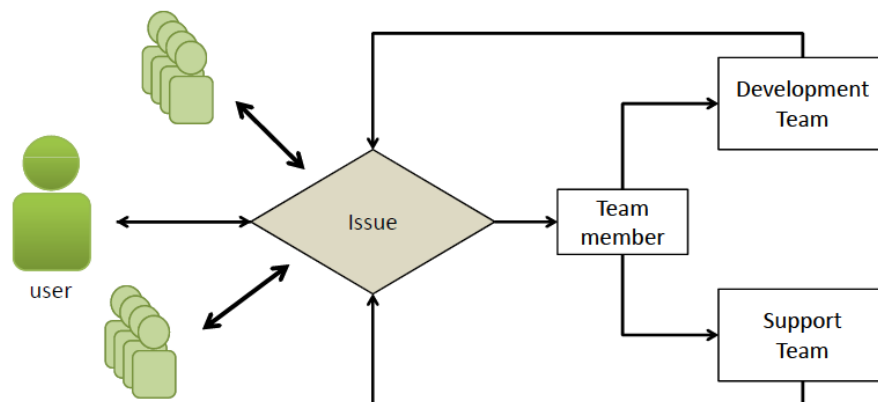
**Crowdsourcing user support activities**

- The Ambassadors programme is an example of giving users a certain autonomy which is an asset for user uptake and is one of the mechanisms for long-term sustainability of the Scratchpads community and for other ViBRANT products and services. The network is fully operational as is reflected by the Ambassadors achievements.<sup>5</sup>
- Training courses raise awareness and of course promote the platform to different communities but also play an important role in training users that eventually become trainers for their research community.

**Maximising the efficiency of the existing support structures****Project management – Issues queue**

Straight-forward workflow

Co-learning environment



<sup>5</sup> <http://vbrant.eu/content/m315-ambassadors-network-fully-operational>

- The use of an open source integrated project management system such as Redmine enables users to act in a co-learning open environment and underpins a successful co-learning scheme.<sup>6</sup>
- The wiki based documentation site is arguably contributing towards sustaining an efficient documentation resource. Support team members, as well as users, can contribute to the wiki improving the quality of the information in a collaborative environment.

## How much are the support services used? A measure of success.

### Training on-site & on-line

ViBRANT's lifetime 1 Dec 2010 - 1 Dec 2013

38 training sessions – 453 participants

audience: worldwide

### Redmine issues platform

1,200 issues/year

61% are processed within a day

81% within a week

### Help wiki

March 2012 - October 2013

133,095 views

More metrics are found on the Help Wiki special statistics page.<sup>7</sup>

## Understanding and responding to user needs

Users are at the core of ViBRANT's development approach. Getting to know the specific training and support needs of the Scratchpads users and of potential users is important. Sociological studies feedback into service and development priorities.

### Training evaluation

Training has also been evaluated by a feedback training form, available online on the Scratchpads website.<sup>8</sup> After each Scratchpad training course participants are asked to fill out the feedback form and in total we received 175 forms from participants:

2010-2011	2011-2012	2012-2013
54	44	77

Two sets of questions were answered by each participant. The first set is used to assess the impact of the training course to Scratchpads understanding. The second set is used to assess the communication

<sup>6</sup> Brake I. et al. ZooKeys 150 (2011): 177-192. <http://dx.doi.org/10.3897/zookeys.150.2191>

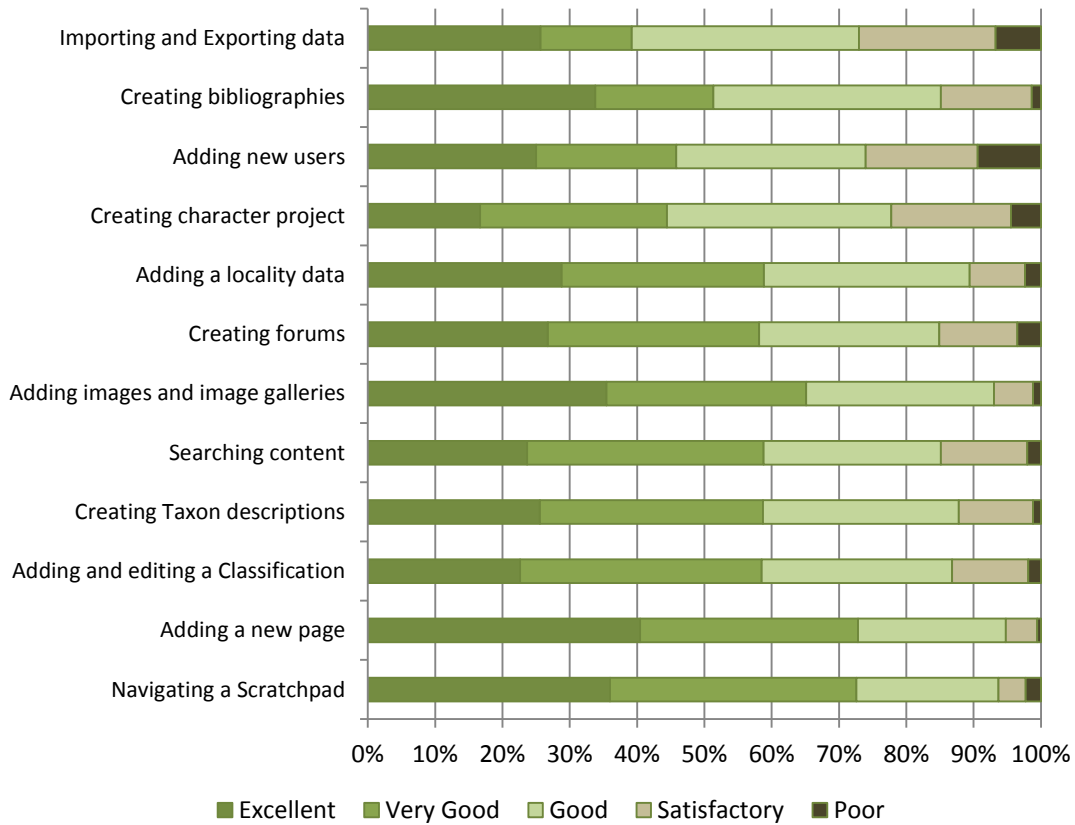
<sup>7</sup> <http://help.scratchpads.eu/w/Special:Statistics>

<sup>8</sup> <http://scratchpads.eu/training-course-feedback>

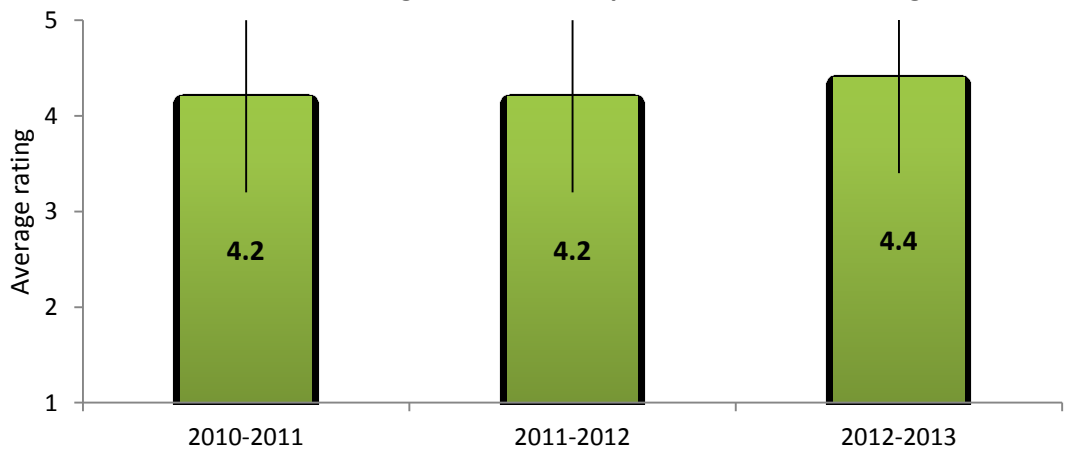
abilities of the principal and assisting trainers. 95% of the respondents suggested that they have a good, very good or excellent ability to set-up a new Scratchpad site.

Results are represented in the following diagrams.

### Confidence in performing different actions after training

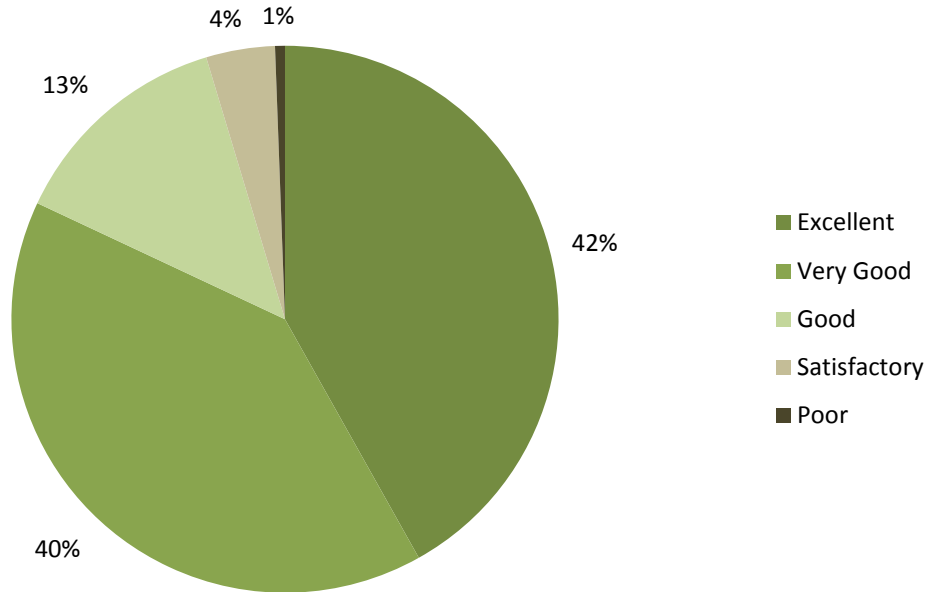


### Better understanding of what Scratchpads can do after training



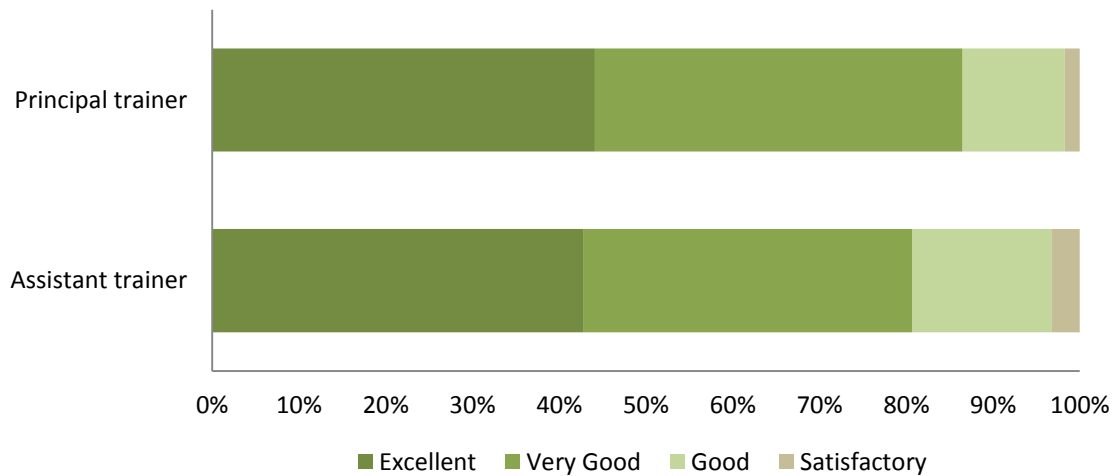
Average rating: 1=Poor to 5=Excellent. Vertical bars denote standard deviation value

**Ability to set-up a new site after training**



*95% of the respondents suggested that they have a good, very good or excellent ability to set-up a new Scratchpad site.*

**Overall impression on trainer's performance**



### Maintainer Survey 2011

In addition to the feedback on the training courses via the online evaluation form, an extensive survey has been undertaken throughout 2011 to obtain data on:

- the demographics of the users;
- use and user satisfaction;
- Scratchpads support quality: training and other supports services.

Full details of this are available in Brake et al. (2011)<sup>9</sup> and in the report D3.2 Service delivery and evaluation.<sup>10</sup> The survey gave valuable insights on how Scratchpads and the support services are used and valued by users and helped us to developed recommendations for software development, support services, project management.<sup>11</sup>

### Interviews with users

Interviews with users, ex-users and non-users inform about usability and adoption issues related to the use of Scratchpads but also about strategies to approach potential new user communities. More information is given on the following pages.

## Potential mechanisms to increase user uptake

Infrastructures like ViBRANT make pieces of work and the organisation of work visible to a large audience, where before these were only visible to colleagues sharing the same office or working in close proximity to each other. Making invisible work visible is one of the mechanism that increases user uptake. Other important elements to make users engage are: increase user's autonomy, organize co-learning between developers and users, create concepts and tools that offer advantages over the traditional offline organization of science. Several activities developed under the ViBRANT umbrella address users engagement and mechanisms used to increase user uptake are discussed in 'M3.11 Potential mechanisms to increase user uptake'.<sup>12</sup>

## Suggestions for potential user groups and audiences for Scratchpads

### New user groups

The member community of Scratchpads is diverse, and covers many disciplines within biological systematics, but at the same time most of these communities have not taken up Scratchpads as a community, but mainly at the level of individual members of such communities. The various studies have indicated that to get the thing going, adoption at community level is essential. If not, researchers feel that starting themselves with a community oriented Scratchpad, may be too labor intensive and does distract them from their main task, that is publishing about their findings and discoveries.

As several other studies summarised in this report suggest, the different scholarly communities are using Scratchpads to some extent, but it is unclear to which extent the core players of most communities are

<sup>9</sup> Brake I. et al. *ZooKeys* 150 (2011): 177-192. <http://dx.doi.org/10.3897/zookeys.150.2191>

<sup>10</sup> [http://vbrant.eu/sites/vbrant.eu/files/D3.2\\_291112-corr-280113.pdf](http://vbrant.eu/sites/vbrant.eu/files/D3.2_291112-corr-280113.pdf)

<sup>11</sup> <http://vbrant.eu/sites/vbrant.eu/files/M313%20def.pdf>

<sup>12</sup> [http://vbrant.eu/sites/vbrant.eu/files/Milestone\\_311\\_VU\\_130112.pdf](http://vbrant.eu/sites/vbrant.eu/files/Milestone_311_VU_130112.pdf)



included. This needs further investigation. However, in the interviews we got some indications of the opposite. And we learned that core players would be willing to use Scratchpads, but they simply do not invest resources in changing from their existing platform to Scratchpads. As one interviewee said: if someone else would take the lead, he may be willing to add his data and material to that Scratchpad. But priorities are different; publishing is more important than co-developing a new infrastructure. A structural factor seems to be that the data infrastructures are not indispensable for systematics/taxonomy scholars; they can do without it. In Whitley's (2000) terminology, the field is characterised by low uncertainty and low (mutual) dependency, and this results in the proliferation of tools and infrastructures.

Where researchers are strongly dependent on each other (high energy physics; astronomy), concerted action to create one shared infrastructure is essential and therefore more easily to create. Therefore it may be a good strategy to try to include core researchers in the various communities into Scratchpads, possibly facilitated by funding to support the transition.

The interview study indicates that the various research communities seem rather isolated from each other, and in e.g. the Ostracoda community, two sub-communities existed without mutual communication. Hence, a strategy of including potential user communities as active members may need a dedicated one by one approach. Of course, the Ostracoda community experiences cannot be generalised, as 'the biological research communities are as varied as biodiversity'. But it is exactly this variety that may need to be addressed to have a single infrastructure adopted.

Integration of non-scholarly communities (as user/member) is probably even more difficult – as these communities have different practices, norms and interests. This, by the way, is also relevant for efforts to include citizen scientist into the system. As long as they are isolated individuals, mobilising them may be relatively easy, and only dependent on individual interests. But as soon as citizen scientists transcend the individual level, as e.g. in the bird watchers community and many other similar communities, they will have developed own practices, norms, reputation systems and interests, which have to be taken into account (see section 5 in 'M3.17 Suggestions for potential new user groups'.<sup>13</sup>)

As the log file analysis indicates, also non-scholarly users do visit Scratchpads, and this is an indicator of societal impact. These policy and other users are crucial for the sustainability of funding. Improving the interface with this kind of users seems important from the impact perspective and from the sustainability impact. A follow up project may involve activities related to e.g. policy users or industry users of biodiversity data, in order to mobilise actively these potential user groups.

### **Use and impact**

A core activity in WP3 is the study of use and impact. As well known, the methods and data to investigate scholarly and societal impact of research infrastructures are to a large extent still lacking, and efforts to develop methods have not been very successful up to now. Therefore we have done a few pilot studies in which we developed tools to study impact, based on an understanding of how impact is generated. We developed the concept of productive interaction with (scholarly and societal) stakeholders, as a condition for generating impact. This approach informs also on the question about new user groups (=increasing impact). To reach those new user groups successfully, maintaining of and investing in good relations seems crucial.

<sup>13</sup> <http://vbrant.eu/sites/vbrant.eu/files/M317.pdf>

Some pilot studies were successful, and others did not yet lead to success, although steps forward were made. What did we learn about the impact of Scratchpads? Some conclusions can be drawn already, but other issues are still unclear.

1. **Log file analysis**

The scholarly use is dominant, as is shown by the number of visits (according to the log files). Also the use by some other user categories is substantial, especially the governmental sector. Of course we stress once more that this is based on the 25% of visits that do not come through general access providers. The 75% visits that do come through general internet access providers needs further study. Our expectation is that specific groups are strongly overrepresented in that category: The general public (including citizen scientists) and the (higher) education sectors, as these categories may much more frequent work / access from home. We plan further and more detailed analysis of the data.

2. **Funder and output analysis**

Impact can be measured by the level of adoption and use, but also by studying the kind of use made of the infrastructure. The funder of course wants to know these different kinds of impact as this legitimised their funding policy. On a more general level than Scratchpads' impact, we studied the relation to dedicated research funding instruments and research content. We investigated whether biodiversity researchers funded in EC programs have a different thematic focus compared to researchers not funded by the EC. From a data perspective this was difficult. And, it hardly can be done for a running project, whose output still has to come to a large extent. In a pilot study we were able to show that the EC funded researchers do to some extent work on different topics – showing the funding had an effect, and that the effect of funding can be measured.

3. **Citation analysis**

If the scholarly community takes up Scratchpads, one would expect that scholars refer to Scratchpads either as a formal citation, or as an in-text reference. A method was developed for measuring the use of tools and databases in scholarly papers, but for several technical reasons (see section 4 in M3.17 Suggestions for potential new user groups' <sup>14</sup>) the analysis for Scratchpads was not conclusive yet.

4. **Network analysis.**

Another form of scholarly impact of Scratchpads would be new collaboration networks, and especially interdisciplinary networks. The results of this study will come available soon.

## Users and use of other ViBRANT services

The Scratchpads platform is at the core of ViBRANT but it is not the only service being developed through the ViBRANT project. Three other services that have collected data on users and use are highlighted in the next paragraphs.

### OBOE

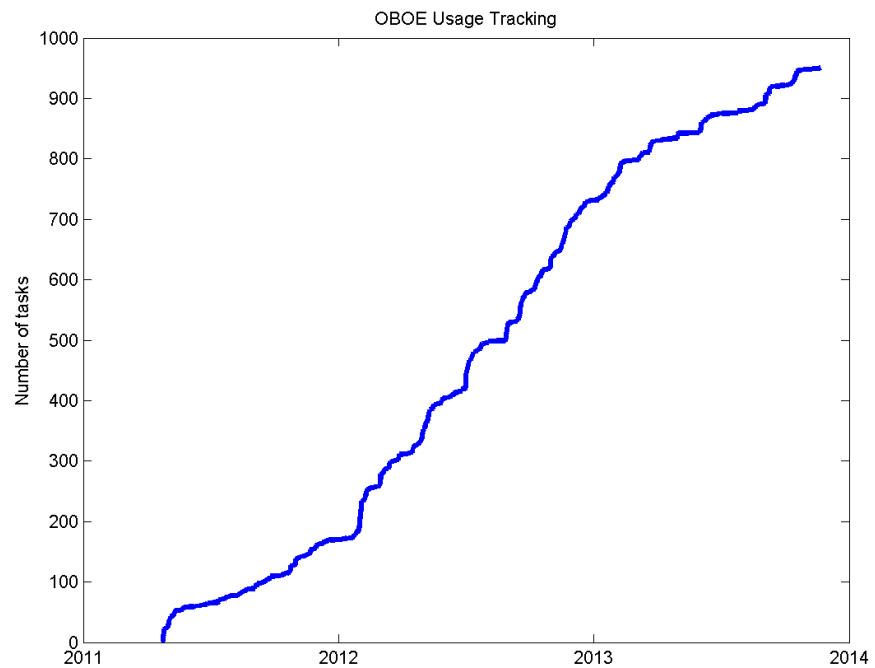
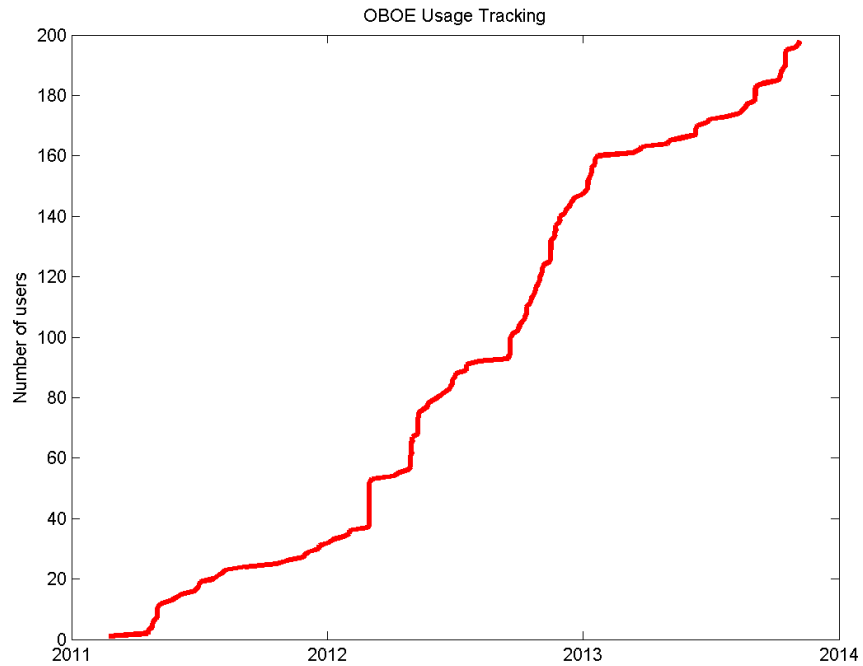
The Oxford Batch Operation Engine (OBOE) is a science gateway to research computing, with new methods available to developers to integrate applications as software services, removing the need for bespoke user interfaces. For the user, OBOE provides easy and uniform access to well-known community research applications and new developments alike without the need for software installation or

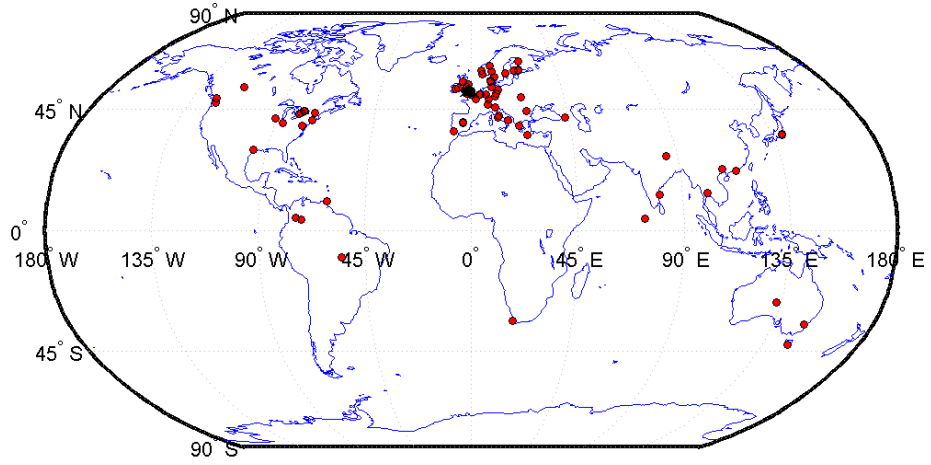
<sup>14</sup> <http://vbrant.eu/sites/vbrant.eu/files/M317.pdf>

technical knowledge of running software in the cloud. For the taxonomy and biodiversity research community, OBOE is also available directly in Scratchpads.

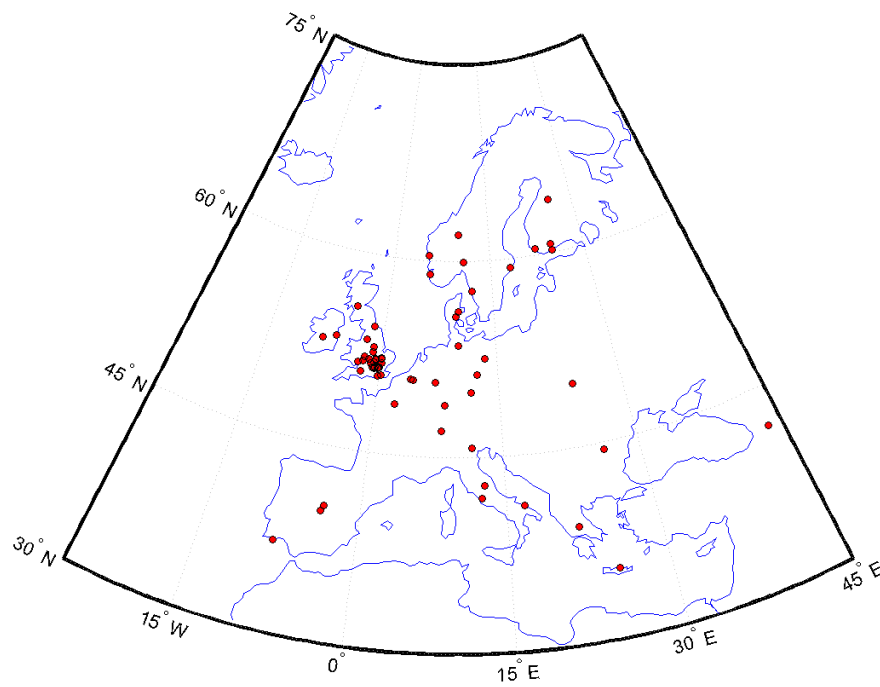
OBOE went live in March 2011 and as for 21 November 2013, the following use statistics were logged:

- total number of registered users = 198
- total number of tasks submitted = 950





User location globally



User location in Europe

### **CartoDB**

CartoDB, launched in spring 2012, is an Open Source visualization platform. It is now used by over 25.000 users. Of those users, over 1000 users are students and educators in universities. Undergraduate and graduate level courses have now been taught on CartoDB in departments such as journalism, GIS, biology, and data visualization. On December 3rd, 2013 the first in a series of public courses will be taught using CartoDB; over 4000 students have signed up for the course. Many research institutions are now using CartoDB including INBO in Belgium, FAPESP in Brazil, and the MIT Sensable City Lab in the USA. In the data visualization and journalism sector, CartoDB is being used by small and large organizations alike, including Al Jazeera, Aftonbladet, the Wall Street Journal, the Guardian and others.

The CartoDB website logged over 700k visits in the past year. Over 50.000 maps have been published using the CartoDB service.

The source code is available at <https://github.com/Vizzuality/cartodb>. For more information see <http://cartodb.com/>

### **GeoCAT**

GeoCAT is an open source browser based tool that performs rapid geospatial analysis to ease the process of Red Listing taxa. Since June 2012 the GeoCAT tool has generated over 10.000 visits from over 100 countries. Brazil has generated the largest amount of traffic. At least 10 species risk assessments have been created using GeoCAT and have referenced the tool directly. In addition, 11 scholarly articles have been published that reference the original GeoCAT publication. Workshops have been carried out in Korea (IUCN), Madagascar (Kew), Peru (Kew), Puerto Rico (Kew) and Jordan. At least 50 training sessions and demonstrations have been given at Kew.

### **Conclusion**

For a social networking site to be successful, one needs to constantly monitor and manage the e-infrastructure to ensure that the quality of support services remains high. Finding mechanisms to encourage users to participate and to contribute to the site are important.

It has been proven that investment in structuring the necessary support mechanisms, crowdsourcing the support services, maximizing the efficiency of the support systems and assessment of the user base needs, nurture a community based model and keep the open source network community alive. By enabling the end user communities to actively participate in further development of the platform and to contribute in providing support, an open and dynamic collaborative online environment is created, aimed at maintaining the e-infrastructure.

Concerning financial sustainability, Scratchpads have been incorporated into the Natural History Museum's (NHM London) digital strategy, as indicated by the Museum's Strategic Plan and as such are now supported by tenured staff. Scratchpads financial sustainability has been outlined in the report 'D 2.3 Financial sustainability. Report on options for the ViBRANT financial sustainability model including selection of preferred model and accompanying Service Level Agreements (SLA's)'.<sup>15</sup>

<sup>15</sup>[http://vbrant.eu/sites/vbrant.eu/files/D2.3\\_Sustainability.pdf](http://vbrant.eu/sites/vbrant.eu/files/D2.3_Sustainability.pdf)

## Milestones associated with D3.3

Milestone	Description	Due	
M3.11 Potential mechanisms to increase user uptake	This milestone discusses several activities in ViBRANT that focus on the engagement of users. Emphasis is on the mechanisms used in the activities to increase user uptake	13/01/2012	<a href="http://vbrant.eu/sites/vbrant.eu/files/Milestone_311_VU_130112.pdf">http://vbrant.eu/sites/vbrant.eu/files/Milestone_311_VU_130112.pdf</a>
M3.15 Ambassadors network is fully operational	State of the art of the Ambassadors network is given and a mechanism for long-term sustainability of the Scratchpads community support is established.	31/07/2013	<a href="http://vbrant.eu/sites/vbrant.eu/files/M3.15_Ambassadors_network_%20is_fully_operational.pdf">http://vbrant.eu/sites/vbrant.eu/files/M3.15_Ambassadors_network_%20is_fully_operational.pdf</a>
M3.16 Established user support services to keep the open source network community alive and vibrant	Established support systems and their sustainability post-ViBRANT are discussed.	30/11/2013	<a href="http://vbrant.eu/sites/vbrant.eu/files/M3.16_Established_user_support_services_DEF-121113.pdf">http://vbrant.eu/sites/vbrant.eu/files/M3.16_Established_user_support_services_DEF-121113.pdf</a>
M3.17 Suggestions for potential new user groups	Work towards a better understanding of the diffuse user community for biodiversity informatics. Look at changes that occur in the behaviour as people start using Scratchpads and sharing their work through these new technologies.	31/10/2013	<a href="http://vbrant.eu/sites/vbrant.eu/files/M317.pdf">http://vbrant.eu/sites/vbrant.eu/files/M317.pdf</a>
M3.18 Platform for Cybertaxonomy workshop in Berlin	In several meetings with European taxonomists the need for an in depth training in usage of the EDIT Platform tools was expressed. The workshop will be attended by taxonomists from all over Europe	30/11/2013	<a href="http://vbrant.eu/sites/vbrant.eu/files/M3.18%20Platform_for_Cybertaxonomy_workshop_Berlin_Nov2013.pdf">http://vbrant.eu/sites/vbrant.eu/files/M3.18%20Platform_for_Cybertaxonomy_workshop_Berlin_Nov2013.pdf</a>