



## D5.2 - Functional tools

Release of functional tools as products accessible through the API.

<b>Due Date:</b>	30/11/2012
<b>Part of:</b>	D1.1 - Overall Management
<b>Work package:</b>	WP5: Data
<b>Reporter:</b>	Neil Caithness
<b>Completed:</b>	30/11/2012

### Executive Summary

The delivery of distributed functional tools, or services, accessible through an API requires a number of supporting systems to be in place.

1. A stable web application to handle API requests, schedule jobs, monitor progress, deliver results and store relevant metadata.
2. A replicated database to hold user account details and store job results.
3. A set of remote machines capable of executing jobs as requested by the main application.
4. The executable codebase for the tools and (if required) their associated databases.
5. A secure communication mechanism between the main controlling application and the compute execution machines.

The Oxford Batch Operation Engine - OBOE (<https://oboe.oerc.ox.ac.uk/>) - was originally designed as a REST back-end for Scratchpads, to allow Scratchpad users to submit jobs to be computed externally to the Scratchpad servers, whilst presenting Scratchpad developers with a single and concise API. OBOE has since expanded to be a web-based front-end for users to interact with services directly, as well as providing the API back-end for system developers.

In the interests of sustainability the OBOE system as a whole has now been ported from a physical development machine to a virtual machine infrastructure hosted by the OeRC at Oxford. This eliminates the possibility of a single machine failure breaking the system. Likewise, the supporting database is now replicated across a set of physical and virtual machines.

A number of compute engines also hosted on the same virtual machine infrastructure at the OeRC are now dedicated to running OBOE remote services, though there is also the possibility to host services on any authenticated machine connected to the internet. Some services (e.g. the phylogenetics tools Beat and MrBayes) run on the Oxford Super Computing Centre machines (currently on a free time allocation to the ViBRANT project.)

Communication between OBOE and its remote compute engines is via a decoupled drop-and-compute system developed specifically for OBOE to be platform independent and remotely configurable.

## List of milestones contributing towards the deliverable

<b>ID/Description</b>	<b>Reporter</b>	<b>Date completed</b>
M5.11 - Review existing key construction software and workflow interaction with both Scratchpads and the CDM	Régine Vignes-Lebbe	Mon, 28/02/2011
M5.12 - Review user requirements for the visualisation tool for Scratchpads	Javier de la Torre	Mon, 28/02/2011
M5.14 - Review of target applications (phylogenetics)	Neil Caithness	Thu, 31/03/2011
M5.19 - Deliver prototype key-generating service through Scratchpads	Régine Vignes-Lebbe	Wed, 30/11/2011
M5.20 - Metadata repository design plan	Neil Caithness	Sat, 31/12/2011
M5.21 - Implement visualisation tool for Scratchpads	Javier de la Torre	Wed, 29/02/2012
M5.22 - Review algorithms for biodiversity indices	Javier de la Torre	Wed, 29/02/2012
M5.25 - Implement custom wrapper for the identification service that can be used by Scratchpads	Neil Caithness	Sat, 31/03/2012
M5.26 - Review of target applications (bioclimatic modelling)	Neil Caithness	Sat, 30/06/2012
M5.33 - Generic computational framework for geo-spatial analysis via OBOE.	Neil Caithness	Sun, 30/09/2012
M5.34 - Land cover classification tool	Neil Caithness	Fri, 30/11/2012

## **Progress in year three**

Though this formal deliverable is complete, we recognise that much of the ongoing work in year three (Milestones M5.34, 35, 36, 37, 38 and 39) will continue to build the set of functional tools and are therefore also listed against D5.2. These tools will also make use of the innovative CartoDB system for mapping and visualisation that has been developed by partners Vizzuality.