RedFeather – Resource Exhibition and Discovery: A Lightweight Micro-Repository for Resource Sharing

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Abstract

Open Educational Resources (OERs) depend on being hosted in repositories so that they can be effectively viewed, managed, searched and indexed online. Content – especially multimedia content – that is not hosted in this way has no metadata and is effectively dark to the wider community. Similarly content that is not described properly, and with appropriate licenses, is of limited use. This is a challenge for small-scale contributors, such as individuals and small projects, as the overhead of setting up and administrating a content repository can be prohibitive.

In this paper we propose RedFeather, a micro-repository, as a solution to this problem. RedFeather is a simple and straightforward server-side tool that requires zero to little configuration, but that provides the core functionality of a fully-fledged OER repository, including: resource pages with inline preview, a resource manager with streamlined workflow, and views of the resource in OER critical formats (including RDF, JSON, and RSS). RedFeather is fully customizable, with a flexible plugin architecture and configurable templates, but also works without any customization as a single php script file uploaded to a web server.

The goal of a micro-repository like RedFeather is both to enable small-scale contributors to easily join the OER community, and to act as a intermediate step for larger contributors beginning a collection, or requiring a temporary home for their resources while a more substantial repository is developed. Our hope is that by lowering the barriers to participation, RedFeather can help the OER community to take advantage of the long tail of small to medium-sized content creators.

Keywords

OER, micro-repository

Introduction

Open Educational Resources (OER) promise a new engagement between educational institutions and the public, and potentially a widening of educational opportunity in society (Caswell et al, 2008). Although much has been said about the challenges for larger institutions engaging with OER (Sclater, 2010), there has been far less attention paid to how individuals or smaller groups can engage.

Currently there are significant barriers to these kinds of small-scale OER contributor, not least in where and how they publish their materials. Traditional repository platforms such as the research repository EPrints (Simpson and Hey, 2005) require significant configuration and investment to deploy (Lynch, 2003), and even extensions such as EdShare (that provide simplified workflows and improved tools focused on teaching materials) still require significant technical skill to both deploy and maintain (Davis, 2010). For a small or personal collection of OER, the overhead required in hosting such a system often far outweighs the perceived value of

sharing.

It is still possible for these types of contributors to upload their work to a public website, but rich media is effectively dark to search engines without adequate metadata. In addition they may forget important licensing information, and materials published this way are invisible to national indexers like Jorum or Xpert.

The lack of simple solutions for sharing OER resources is a serious limit on the take up of OER, and exacerbates the problems that smaller groups and individuals have in contributing to the growing OER community (Lane, 2008).

Our proposed solution to this problem is a repository alternative called RedFeather (Resource Exhibition and Discovery). RedFeather is a lightweight server-side script that fosters best practice OER sharing without the overheads associated with the installation and use of a full-scale repository platform. By eliminating the need for complex server infrastructure and emphasizing a concise, simplified workflow, RedFeather provides an out-of-the-box solution for users wishing to quickly annotate their OER and make them available in a variety of formats (including HTML, RSS, RDF and JSON).

In this paper we describe these underrepresented small-scale contributors, present the requirements and characteristics of the tools needed to support them - gleaned from more than six years of repository and OER development (Millard et al. 2008; Borthwick et al. 2009) - and present RedFeather itself. Our hope is that tools like RedFeather can democratise the process of OER contribution, and unlock the long tail of potential contributors.

Who is RedFeather For?

The main goal behind traditional repository software is to provide users with a versatile, high-performance repository that can be configured to suit a wide range of scenarios. This flexibility is achieved through highly modular design and a native feature set broad enough to anticipate a wide variety of user requirements. Unfortunately, this increased versatility comes at the expense of simplicity and makes deploying and maintaining a fully customised repository a considerable investment.

This leaves small-scale OER contributors with few options for publishing their resources and making them widely available on the web.

When we first envisioned RedFeather, we identified a number of potential users who would benefit from a low barrier, minimal infrastructure repository and described typical scenarios of their use. Two of these scenarios, the 'small project' and the 'solo sharer' illustrate how RedFeather meets their OER needs:

Scenario 1: The Small Project.

Imagine a small JISC OER project, SMART, who is funded to collate and release the diaries and writings of Christopher Strachey as a rich collection of computer history teaching resources. The project is a collaboration between four different institution's libraries. Between them they want to collect all their materials together so that they can visualise the whole collection and determine which are of most value. At the end of the project the materials will be deposited in Jorum.

There are too many resources to email and even then the individual files would still need to be annotated. SMART are initially attracted to a teaching repository but soon realise such a

system is over-specified for their needs since this is a one-off project and won't have on-going community activity.

They require a low-maintenance alternative that can be deployed on the project's website so that all the files can be uploaded to one central point, where they can be visualised and annotated and reviewed. However, at the end of the project they need to have a simple mechanism where they can export their collection to its final home – in this case the JISC Jorum repository.

Scenario 2: The Solo Sharer.

Joanna is a physics lecturer. She would like more people than her immediate students to benefit from her teaching materials by making them openly available. Whilst her institution does not prevent her from making these resources available, they do not provide the means to do so. Joanna would like her students to be able to browse all her resources from a central location and use keywords and description metadata to find relevant material. She would also like to embed some of the shared content in her personal blog. She has no strong views about the metadata schema, page layout and styling, as long as the functionality to upload and share is present.

Joanna therefore needs a straightforward solution without any significant technical requirements. She can upload files to her staff website, but is not in a position to run a database, and in any case does not have the skills or time to configure complex server-side software.

RedFeather Features

RedFeather takes a new approach to OER publication software, and is a micro-repository designed around the needs of these small-scale contributors as opposed to large groups or institutions. Many features that are prominent in traditional repository software become redundant as the number of users and resources decreases. Individual user profiles and strict resource ownership has questionable value in a system designed for individuals and smaller, close-knit groups. Other complex functionality, such as the ability to automatically import resources via protocols like SWORD, or by unpacking archives, cannot be included without introducing unacceptable dependencies on the server.

However, there is still a need to make resources available through a range of formats (including important OER metadata), to manage the collection effectively, and most importantly have an impressive online view that makes hosting via the micro-repository more attractive than a simple download link.

As a result we identified these key features:

1. Streamlined workflow that enables users to quickly upload, annotate and publish their material on-line
2. Resource page with online – inline preview, licensing, and essential metadata
3. HTML, RDF, JSON, and RSS views of the resource
4. Resource manager
5. Simple implementation through a lightweight server side script
6. Customisable look and feel

In the following subsections we show some of these key features as provided by RedFeather.

Resource page

Figure 1 shows a Resource Summary Page in RedFeather. It features a full in-browser preview of the uploaded file, clearly laid out metadata, and a variety of social networking options, including Twitter tools and a Facebook commenting widget.
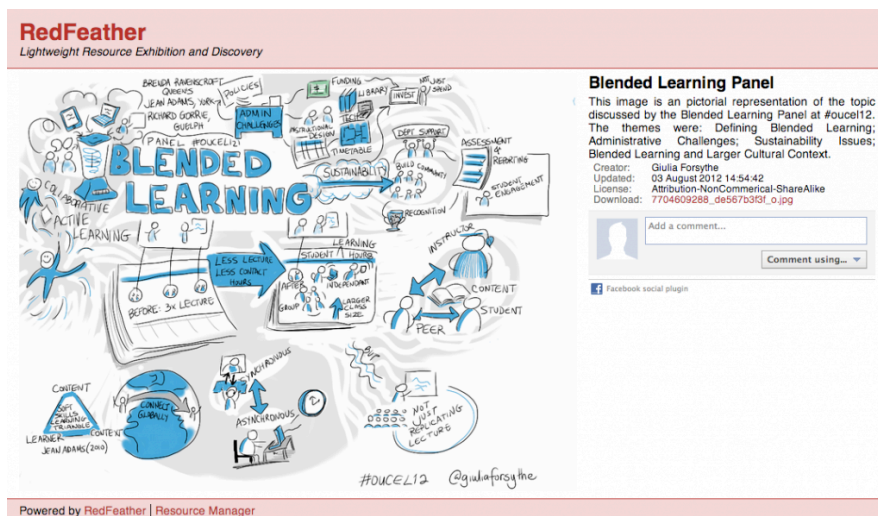

Figure 1. An example RedFeather resource summary with in-browser preview, metadata and Facebook comment widget.

Index

The index page for RedFeather (shown in Figure 2) includes a customisable description of the repository, an ordered list of the uploaded documents, and links to the repository RSS, JSON and RDF. A simple resource filter is also provided so users can quickly find resources relating to a certain keyword or phrase. From here users can click the individual titles to visit the resource page for the item, or download the file directly using the link provided in the metadata box.
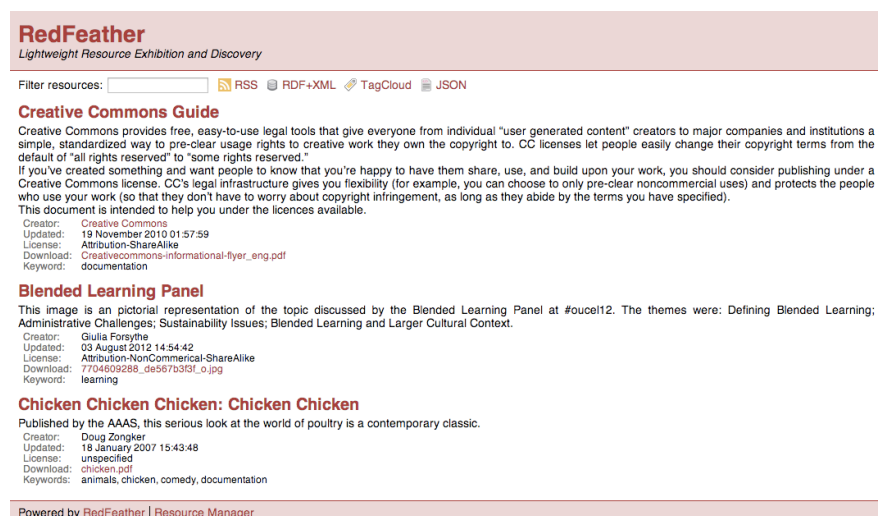

Figure 2. A typical RedFeather index page, with filter box, RDF/RSS feed links, and the list of resources

Resource Manager

The resource manager (shown in Figure 3) allows the site owner to upload, edit, or delete content. The default workflow (shown in Figure 4) includes a title, description, asserted licence, creator attribution, and list of keywords. We consider this the minimal set of metadata to afford best-practice OER deposit.

Figure 3.. Resource Manager – showing existing resources (with options to reorder, edit, view and delete), the list of currently unannotated files (uploaded via FTP) and the main resource upload options.

Figure 4. The RedFeather annotation workflow with the default metadata schema

Customisation

The default RedFeather template gives the repository a simple single column design and bold headers. It also supports a certain amount of customisation and the standard Red theme can easily be changed to use the colours and font-style of the owner's choice – it is also possible to change the name, tagline and description of the repository (shown in Figure 5). More significant customisations of RedFeather (see Figure 6) can be achieved by writing a plugin to override the template (see plugins section below for more details).
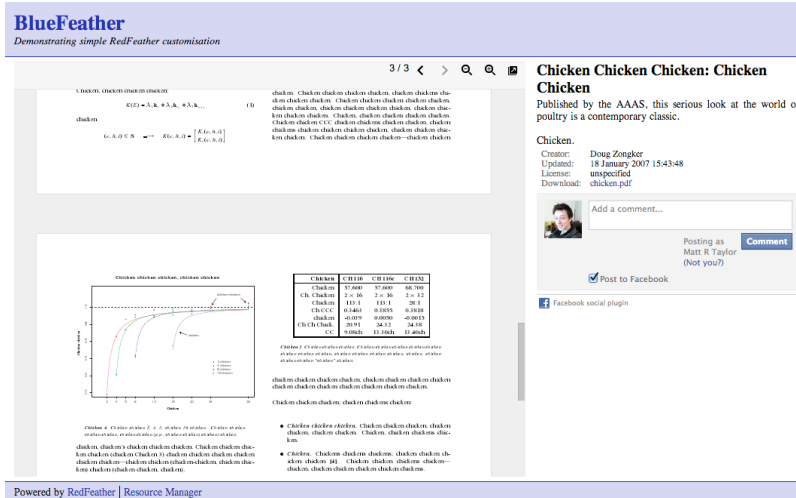
Figure 5. The RedFeather default template with a customised repository name, tagline, colour scheme and font.

Figure 6. Re-skinned using Impeccable by FCT

Implementation

RedFeather is implemented entirely within a *single PHP script* to ensure maximum server compatibility and to help reduce any problems users might experience during installation. In addition to this, eliminating the need for an external database allows the system to be deployed without having to involve system administrators. The only notable dependencies are JQuery (which is indispensable for cross browser JavaScript) and the Google Docs Viewer (without which there would be no embedded previews). Fortunately, both of these dependencies are resolved in the client at view time and therefore add no overhead to the installation process.

RedFeather installations are entirely self-contained and the PHP script, site configuration, files and metadata are all stored within a single directory, allowing them to be trivially relocated or deleted without consequence.

Plugin Architecture

Given that the primary motivation behind RedFeather is the desire for simplicity, the plug-in architecture similarly needs to follow that design philosophy. In RedFeather each plugin is composed of a single PHP file that can be installed by simply copying it into the web space alongside the main repository. This simplicity also translates to the loading process: plugins are activated by appending their content to the main RedFeather file using a PHP include. This means that there is no need to parse or process the plugins in any way. It maintains consistency within the system since there is no difference between a plugin and the RedFeather core itself. In effect, the main RedFeather source is just a collection of the most useful plugins.

Everything in RedFeather is achieved through the use of functions: page loading, toolbar rendering, and workflow management. Furthermore, every function can be overridden in a plugin, allowing a user to change the behaviour of almost any part of RedFeather. For example, if a user doesn't like the layout of the browse page they can simply create a plugin that replaces that part of the system as shown in Figure 7.

Figure 7 An example of function overwriting

The design challenge for RedFeather thus became one of code factorisation: how to best break down the code into functions in order to facilitate code reuse? In the example where we're building a plug in to replace the browse page, the existing code is already decomposed into various chunks: code to render individual fields, individual resources, the complete list of resources and the entire browse page itself. As an example, to adjust the browse page to include a description at the top, you would only have to edit the "page_browse" function (which consists of a few lines of code). Similarly, if you want to add an icon to each resource you might overwrite "generate_resource".

RedFeather Deployments and Future Work

RedFeather has been deployed within a number of projects to provide resource sharing within the team and web based dissemination of project outputs. For example, The Southampton Learning Environment Project[1], and the Southampton Student Dashboard Project[2].

On-going work for RedFeather includes further deployments following which we will carry out an evaluation of the user's view of the effectiveness of RedFeather as an OER micro-repository.

We have already planned some features to extend RedFeather including:

1. support for more media types with the highest value being video and audio
2. support for virtual collections of resources

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[1] http://slep.ecs.soton.ac.uk/repository/

[2] http://www.sle-dashboard.ecs.soton.ac.uk/overview

3. a WordPress plugin where RedFeather provides the resource sharing rather than the inbuilt CMS.

RedFeather is an Open Sourced project and we will encourage our users to give us feedback to identify the future features that will give them the highest value.

Conclusion

With RedFeather we have created a micro-repository system that should satisfy the majority of small-scale OER contributor requirements (in-line previews, commentary, organisational tools, and high quality, indexable OER metadata) with minimum configuration, while still allowing straightforward customisation through a plugin architecture and design templates.

RedFeather and it's installation script are available under an open source licence from: http://redfeather.ecs.soton.ac.uk/

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