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## **Institutional e-Print Repositories**

### **Business and IPR Issues**

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**Abstract** A report summarising business models and IPR issues in the context of the e-Prints UK project

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## Introduction

The ePrints UK (<http://www.rdn.ac.uk/projects/eprints-uk/>) project is funded by the Joint Information Systems Committee (JISC) as part of its Focus on Access to Institutional Resources (FAIR) Programme. The aim of the project is to develop a national service provider repository of e-print records based at the University of Bath, derived by harvesting metadata from institutional and subject-based e-prints archives using the Open Archive Initiative Protocol for Metadata Harvesting (OAI-PMH). In addition, the project aims to provide access to these institutional assets through the eight Resource Discovery Network (RDN) faculty level hubs and the Education Portal based at the University of Leeds. It is also investigating the use of Web Services technologies for the enhancement of metadata and for the automatic linking of citations.

The first ePrints UK supporting study introduced the project and assessed the prospects for institutional repositories in the UK (Day, 2004). The second study looked in more detail at collection development issues from the perspective of both service and data providers (Hunter 2004). The third study explored the usefulness of the IR and OAI technology for the Research Assessment Exercise in the UK (Day, 2004). This fourth paper looks at the importance of business models and IPR for the creation and maintenance of the ePrints UK service (Hunter, 2004).

Michael Day supplied the bulk of the references.

Essentially this paper summarises the approach of the ePrints UK project to business models and IPR issues. During the project most issues discussed were technical, except in the context of the workshop series held in the UK in Oxford, Nottingham, Manchester, Bath, and Edinburgh, during 2004, and during various meetings where presentations were given (such as the JISC All Hands meeting at the De Vere Grand Hotel in June 2004, and the NAG conference in Birmingham). However the project has the advantage of the experience of the Open Archives Forum project, which was co-ordinated by UKOLN from 2001 - 2003, and whose principal function, in addition to disseminating information about the Open Archives idea, was to provide a forum for the discussion of issues arising from the take up of the technology. Much of this paper builds on the work and experience of the Open Archives Forum - particularly the work of the organisational issues working group, during which many of the important issues for the stakeholder and user communities emerged.

The ePrints UK project therefore developed in the context of a growing body of knowledge about the legal and organisational issues which surround the implementation of a Institutional Repository. This study reflects the experience of the ePrints UK project of the Business Models and IPR questions as essential elements in an implementation project.

## The Open Archives approach

### What is the open archives approach?

There are now many repositories of digital materials of many kinds that either are, or potentially could be, assessable over the Web. The idea of open archives arose initially out of the e-print community, where a growing need for a low-barrier interoperability solution to access across fairly heterogeneous repositories led to the establishment of the Open Archives Initiative (OAI)<sup>1</sup>. The OAI exists to develop and promote a low-barrier interoperability framework and associated standards. Its original purpose was to enhance access to e-print archives, but the organisation now sees its technology as a means to more general access to a wide range of digital materials.

When the protocol was first devised, the technology was aimed at enabling the author of a paper to make that paper (and its associated metadata) available, by means of an archived representation of the document, direct to the user. Later developments within the e-print community, and the establishment of inter-working, interoperable e-print archives, showed how interesting and useful third-party services might be layered on top of individual archives.

The potential value to other communities of this approach was quickly understood, and now there is widespread interest in this approach across different types of organisations, including university departments, libraries and publishers. At the heart of the approach is the attempt to disseminate the contents of repositories efficiently through making repository metadata (descriptions of resources in the repositories) available for harvesting and use by various (perhaps 3<sup>rd</sup>-party) services.

The key solution for creating interoperable e-print archives was the work of the OAI: this was the development of a harvesting protocol, now known as the Open Archives Initiative Protocol for Metadata Harvesting, or OAI-PMH. It is important to note that metadata, and *not* ordinarily the content that it describes, is harvested. It is also important to remember that within the OAI 'open archives' has a particular meaning. 'Archives' refers to data repositories; 'open' refers to the availability for harvesting of collections of metadata relating to data repositories. 'Open' may also refer to the standards development process.

The OAI has promised much on the basis of this model, a new pattern for scholarly communication being the most publicised. One of the conclusions which the Open Archives Forum came to was that more likely and achievable results are the goals of surfacing 'hidden resources' and low cost interoperability. Although the OAI-PMH is technically very simple, building coherent services that meet user requirements remains complex.

### Processes and Players

Use of the protocol by an author to self-archive his own work seems relatively simple, but even in this case there are many legal questions which the self-archiver ought to think about (and might have to think about) before setting out to make his/her paper available via a harvesting service. The most obvious question which the author functioning within a university will have to consider is, does the author own the copyright. Traditionally the academic author always retained the copyright

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<sup>1</sup> Open Archives Initiative (OAI) <[www.oai.org](http://www.oai.org)>

in his work, but in principle, this is changing.<sup>2</sup> The situation is therefore very much complicated by the multiplicity of players involved in the creation and development of an institutional repository. Both the process of deposit and the establishment and protection of rights in work made available via an institutional repository are subtle and not always obvious. We need to establish a proper structured framework for these things, and one which is publicly understood by stakeholders and the community which supplies the content for institutional repositories.

Creators are those who create either resources or metadata describing resources, or both. The resources are ordinarily (but not necessarily) such as may be held in a digital repository, such as e-prints, images, learning objects, multimedia, Websites. Resources may be the products of original authors (for example, a research paper), or of intermediary organisations (for example, the results of a digitisation project in a museum). Creators may also act as data providers. Data providers expose metadata for harvesting; the metadata exposed may itself have been aggregated by harvesting from other data providers. Examples of types of data providers include repositories of e-prints, learning objects, cultural heritage resources, and even union catalogues. All of these depend for their usefulness on adequate processes of subject classification and name authority control relating to author details. Service providers harvest metadata from the data providers and implement services based on this metadata. Examples of service providers include learning resource services, cultural heritage services, and e-print services. Service providers may harvest metadata from different types of data providers; for example, a provider of a learning resource service may harvest metadata relating to learning objects, cultural heritage items, e-prints, and from library union catalogues. Users may be end users of the service providers' services, or may be organisations providing, for example, subject-based gateways or institutional portals.

From this rather simplified illustration, it can be seen how important it is for there to be good communication among the various parties involved in building services based on the open archives approach – and also, perhaps, how potentially difficult this might be.

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<sup>2</sup> Universities are now looking closely at the status of the intellectual property created on their premises and by their staff, with a view to maximising whatever benefit might accrue to the institution as a result. Some now make a general claim to the intellectual property produced by members of the institution, but are not currently anywhere near enforcing such a claim. Authors might be aggrieved that the copyright in their own work might be taken away, but the university might argue that the copyright always ought to have belonged to the institution, and that a historical anomaly is being corrected.

## Business models for open archives

### Growth scenarios

Initially, the most active participants in the Open Archives Initiative expected that it would not take many years before the OAI-PMH protocol would be embedded in the infrastructure of the Web, as taken-for-granted as the HTTP protocol now is. If this is to turn out to be so, it will be not only because of the relative simplicity of the OAI framework for interoperability and metadata sharing, but also because of uptake by:

- ◆ research organisations, including universities  
(as part of a change to the pattern of scholarly communication)
- ◆ publishers, especially learned society publishers  
(adding value to the process of dissemination)
- ◆ “memory organisations”, i.e., libraries, archives, museums  
(extending access to the citizen)

### Possible/emerging business models

*What is a business model, especially in the context of the Internet?*

In the Open Archives Forum study of the Organisational Issues involved in the development and running of institutional repositories, the authors chose the following definition of a business model:

The simplest definition of a business model is that it is the "method of doing business by which a company can sustain itself – that is, generate revenue" (Rappa, 2001). This does not mean that a business model is *only* concerned with revenue; it should also relate to the value of services and goods provided and the organisation's position in the product supply chain.

They quoted Mahadevan (2000, p. 59):

A business model is a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream and the logistical stream. The value stream identifies the value proposition for the buyers, sellers, and the market makers and portals in an Internet context. The revenue stream is a plan for assuring revenue generation for the business. The logistical stream addresses various issues related to the design of the supply chain for the business.

There is a wide range of business models in use, though obviously it might be the case that some of them are completely inappropriate for institutional archives. The authors of the study observed that Rappa (2001) noted:

some models are quite simple: a company "produces a good or service and sells it to customers. If all goes well, the revenues from sales exceed the cost of operation and the company realizes a profit." Others are more complicated and are based on organisations as intermediaries or facilitators. The recent growth in electronic commerce (e-commerce) means that at the moment there is quite a lot of interest in Internet business models, both new and traditional (e.g., Jutla, *et al.*, 1999; Werbach, 2000; Feeny, 2001).

The OA-F organisational issues study illustrates the arrangement of Rappa (2001), who grouped Internet business models into nine generic categories (Table 1). These include some traditional models that have been successfully adapted for use on the Internet; e.g. those based on

advertising, retailing or subscriptions, as well as models that have been developed specifically to support e-commerce.

**Table 1: Taxonomy of business models identified by Rappa (2001)**

| <b><i>Business model:</i></b> | <b><i>Brief description:</i></b>  |
|-------------------------------|---|
| Brokerage model               | Those that bring buyers and sellers together and facilitate transactions (often fee based)  |
| Advertising model             | Supported by advertising revenue, a Website will provide content and services together with advertising (e.g., banner ads)  |
| Info intermediary model       | Collecting data about consumers and their purchasing habits and selling this information to other businesses  |
| Merchant model                | Selling of goods and services on the traditional retail model   |
| Manufacturer model            | Direct selling by the creator of a product or service to consumers, cutting out intermediaries  |
| Affiliate model               | Offering financial incentives to affiliated partner sites   |
| Community model               | Where users themselves invest in a site, e.g. by the contribution of content, money or time. This can be combined with other models, e.g. advertising or subscription |
| Subscription model            | Where consumers (users) pay for access to the site, usually for high added-value content, e.g. financial information, newspapers, journals                            |
| Utility model                 | A model based on metered usage or pay-as-you-go; depends on micropayments   |

**Source: Rappa (2001)**

The same OAF study points out that an older taxonomy by Timmers (1998):

classified eleven business models that were in use or being experimented with to support Internet e-commerce (Table 2). Timmers's classification of commercial business models in use on the Internet mentioned several potential revenue streams. He noted that some models would be able to raise revenue through membership fees (e.g. for 3rd party marketplaces or virtual communities), while others might be based on charging by service or transaction provided.

**Table 2: Internet business models identified by Timmers (1999)**

| <b><i>Business model:</i></b> | <b><i>Brief description:</i></b>  |
|-------------------------------|---|
| E-shop                        | Marketing of a company or shop  |
| E-procurement                 | Electronic tendering and procurement of goods and services  |
| E-auction                     | Based on electronic bidding, on the traditional auction model but which may integrate contracts, payment and delivery |
| E-mall                        | A virtual collection of e-shops   |
| Third party marketplace       | Common marketing front-end and transactions support for multiple businesses   |
| Virtual communities           | Virtual communities based on communication and information exchange between members, e.g. customers or partners       |
| Value chain service provider  | Specialists in specific functions of the value chain  |



| <b><i>Businessmodel:</i></b>                    | <b><i>Brief description:</i></b>  |
|---|---|
| Valuechain integrator                           | Integrator of multiple steps in the value chain   |
| Collaboration platforms                         | Providers of tools and an information environment for collaboration                           |
| Information brokerage, trust and other services | Adding value to data available on the open networks, e.g. searching, customer profiling, etc. |

***Source: Timmers (1999), Pereira & Fife (2000)***

Many of these models have broad similarities with (or are based on) those business models used in traditional (i.e., non-electronic) contexts, e.g. shops, auctions or advertising. The key difference (and this is an important one) is that the more innovative Internet business models are generally based on the existence of cheap communication costs. There is, therefore, much interest in services that link different businesses or add some kind of value.

*Which might be applicable to open archives?*

The OAF study looked at Rappa and Timmers's taxonomies together, and noted that

many of these commercial (or quasi-commercial) business models will be familiar to those who work in the research community or in academic libraries and other cultural heritage organisations. For example, publishers have used subscription models for many years to provide journals or monographic series. Libraries have also used intermediaries (brokers) like subscription agents and, more recently, content aggregators like Stanford University's HighWire Press or CatchWord (e.g., Inger, 2001). It is possible also, that some of these commercial business models would be of interest to those cultural heritage organisations that are themselves creating digital content (e.g., Harvard Consultancy Services, 2000). However, the most interesting business models from an open archives perspective might be Rappa's 'community model' or Timmers's related idea of 'virtual communities.' These, as currently defined, are services that gain support from members contributing effort, content or money. Thus Timmers (1998, p. 6) writes that the ultimate value of virtual communities comes from "the members (customers or partners), who add their information onto a basic environment provided by the virtual community company." If we ignore the specifically commercial aspect, this is broadly similar to Rappa's more generic community model, one based on user investment.

As an example of a community model, Rappa (2001) cites knowledge networks:

Sites are typically run like a forum where persons seeking information can pose questions and receive answers from (presumably) someone knowledgeable about the subject. The experts may be employed staff, a regular cadre of volunteers, or in some cases, simply anyone on the web who wishes to respond.

This appears to be broadly the type of model employed by the open-source software movement; described by Ljungberg (2000, p. 208) as "a loosely coupled community kept together by strong common values such that software should be free." The Open Archives Initiative itself might be seen as a similar type of virtual community. Other business models which might be of importance to the community include value-added 'information brokers'. The movement toward self-archiving and paradigm change in scholarly communication (which is well supported by, and the origin of the open archive approach) does seem to offer something like a good fit with the virtual community model.

## Recommendations for sustainable business models.

Some of the recommendations from the cited OAF study are still broadly relevant:

### *Why are business models important?*

The study suggested that:

Business models are a method for reflecting real world processes and could be thought of as an intellectual exercise. It seems unlikely that an entrepreneur or strategic decision maker would think about what they do in terms of business models, more likely they would consider the future and functioning of their organisations in terms of the practicalities of supply and demand, of extending markets or perhaps their strategic goals or mission statement. They will clearly be aware that in order to convert their logistics stream into a revenue stream they will need to put forward a value proposition that will attract customers, funding or sponsorship.

An awareness of the model being used can be valuable in a number of ways - maintaining the relevance of business activities and focusing on aims and objectives. If the model works in the first place then "maintenance" of the model will help to sustain the business. However the world isn't static and broader knowledge of other possible business models will allow a company to adjust or even completely change its model to better fit circumstances

### *Business models and Public Organisations*

What is not clear so far is how business models might apply to public organisations such as universities, archives, libraries etc. Many if not most public organisations do nevertheless have extant business models, usually in the form of a mission statement or corporate strategy. In most cases these recognise the three streams (revenue, value and logistic) that underpin our definition of business models. A brief poll of mission statements on the internet of public organisations (primarily universities) both in the UK and Europe revealed all had a mission statement or strategic policy. Approximately 25% clearly indicated recognition of all three streams from our definition. Almost all recognised both value and logistics streams. The omission of the revenue stream is not entirely surprising given the considerably lower risk of losing revenue stream in public when compared to private organisations.

Most public organisations, in common with large corporate bodies, tend to employ multiple concurrent business models. For example University Libraries will employ a merchant model in its dealings with publishers and a community model in its dealings with students. Although some of the models, outlined in the taxonomies above, can be applied in part to public organisations they do to some extent fall short. The overriding *modus operandi* for UK public organisations, however, is a model that is essentially fixed by the community through the government. For Universities this model works something like this: The government collects taxes and gives part of that money to educators. The educators increase the potential value of the workforce by producing well educated students. The students join the workforce, earn money and pay tax to the Government. This type of model could be called a social subscription model.

### *Business models and Publicly Funded Projects.*

A particularly difficult issue is the relationship between the OA movement, OAI-PMH and projects. Projects in this context are digitisation and research projects funded by governments or their surrogates, such as HEFC in the UK. Projects have a split personality from the point of view of business models in that there is a dilemma between the model of the hosting organisation and the model of the funding body. It can be argued that a project is a separate entity that is bound by contractual obligation agreed between the parent bodies. This assumes that clear requirements are given in the contract. In the UK, funding bodies increasingly require digitisation projects to make their digital materials available in "perpetuity". However, there is a lack of linkage between this and clear and consistent advice as to formats, metadata standards and data mark-up schema's. Furthermore, there is little or no strategic co-ordination between funding bodies to ensure cross disciplinary consistency between and within data repositories.

### *Business models and the OA movement.*

Any organisation considering whether the open archives approach can be of use to them needs to consider how their existing business model is effected. Will this new approach form a primary function of the organisation or will it only form one small part? In an organisation where the primary revenue stream is through selling information, it is unlikely that the OA approach would be embraced for data sharing. On the other hand the organisation could benefit from making metadata harvestable.

Public organisations should embrace the OA approach for the following reasons. Sharing knowledge is a primary function and as we have seen is already written into their business models. It provides one means of conforming to the freedom of information acts - enacted Europe wide in 2000 and 2001

### *Conclusions*

Any organisation using a public subscription model is very likely to be both amenable to and gain benefit from integrating the OA approach. Many private organisations could benefit from the OA approach at some level. There needs to be more strategic level coherency between organisations.

## Intellectual Property Right (IPR) issues for open archives

This section provides an outline of the expert report on IPR commissioned from Mark Bide by UKOLN on behalf of the Open Archives Forum, which was presented at the 2<sup>nd</sup> OA Forum workshop, Lisbon, 6-7 December 2002, with the final version of the report published shortly thereafter. It is still perhaps the single most comprehensive study of the question of IPR in the context of the Open Archives movement. Although the term “Intellectual Property” includes a number of different types of intangible property, including patents, trademarks and rights in design, the focus of this report is copyright (and related authorial rights) with which we are principally concerned here, and the “sui generis” database right.

### Overview

The relationship between Open Archives and Intellectual Property is complex, not least because of the complexity of definition of what “Open Archives” are. Any reader of the “Open Archives” literature will quickly discover that there are at least three (possibly more) views of what the “Open Archives” initiative is about:

- ◆ At its most straightforward, what is proposed is a set of technical standards for the “harvesting” and aggregation of simple descriptions of resources<sup>3</sup> (metadata). The supposition is that the controller of those resources wishes to make information about them more widely available (whether for commercial or other reasons) and is therefore willing to make the metadata available for harvesting in standardised form on a Website. Through the aggregation of this metadata, new services (particularly but not exclusively resource discovery services) can be developed for users (perhaps targeted at a particular academic discipline, for example). This is entirely a technical protocol. The question of “open access” to the resources themselves is entirely separable from the metadata – as indeed is the question of access to the metadata that has been harvested.
- ◆ At another level, the Open Archives movement is seen as way of simplifying the process whereby academic institutions<sup>4</sup> can become publishers of the intellectual output of their own academic staff through the development of online repositories. This may, for example, involve the online publication of “e-prints”, perhaps before or after more formal publication in the traditional literature (or perhaps without publication elsewhere). The Open Archives approach allows an efficient way of “co-operative marketing” of the content of those archives, encouraging the widest possible dissemination and exploitation.
- ◆ At what may be regarded as the most contentious level, some supporters of the Open Archives movement see it as underpinning a strategy to develop what is being called “Free Online Scholarship” – a reversal of the typical scholarly journal publishing model, involving supply-side payment rather than demand-side. Authors (or those who stand proxy for them) pay for publication rather than readers (or those who stand proxy for them).

Although these three aspects of Open Archives are closely inter-related, the questions they raise about Intellectual Property Rights (IPRs) – and perhaps equally importantly the relationship

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<sup>3</sup> We use the term “resources” here deliberately – so far as we can tell, there is no reason why those resources described by metadata in an OAI metadata repository should themselves necessarily be digital resources – or (if they are) accessible on the Web.

<sup>4</sup> It is, of course, equally possible for authors to become their own publishers.

between Open Archives and those businesses which depend on the exploitation of IPRs to support their business model— are significantly different.

### **Defining IPR**

The expert report defines and explores these issues, as they relate to both economic and moral rights of exploitation of the works created by authors. Not the least of these issues is the difficulty of managing these rights in a global environment, in the face of substantially different attitudes to IPRs in different jurisdictions and cultures.<sup>5</sup> It explores what constitutes “publication” in the online environment, and how IPRs apply to content that is freely available on the Internet.

### **An infrastructure to support IPR on the network**

In the global network environment, recognition of and compliance with IPRs, if it is to be achieved at all, will require infrastructural technology support.<sup>6</sup> The expert report explores current approaches to technological support of IPRs being developed within the “content industries” and their relevance to Open Archives and how these relate to protection by law and by licence.

### **Metadata and other types of content**

What is the difference between metadata and any other type of content? The question of whether and when metadata records themselves are subject to IPRs is an important topic in the context of Open Archives. There are clearly significant differences between items of “intrinsic” metadata which (in the case of textual resources, at least) can be extracted from the resource itself and “extrinsic” metadata, such as qualitative or subject categorisation, which may have a much higher human creative input and be potentially of much higher value.

### **Stakeholder attitudes**

The interests and attitudes of the various stakeholders— authors, academic institutions, publishers, and users of archives— are also considered in the expert report.<sup>7</sup> What are the significant IPR issues for each of these groups as they relate to Open Archives, and what might be the motivations for each group of stakeholders to co-operate in the development of Open Archives initiatives?

### **Implications for Open Archive Services**

Implications for open archives services explored in the expert report include the following.

- What are the implications of IPRs for Open Archive Services?
- How might their operation be constrained by third party IPRs?

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<sup>5</sup> This includes, for example, consideration of the growing demand from certain countries for the recognition of collective rights in “indigenous culture”.

<sup>6</sup> It is important here to distinguish between such infrastructural support and the technological enforcement of permissions granted by the rights owners. The latter, which is sometimes referred to generically as “Digital Rights Management”, is just one of the applications that depends on the existence of the infrastructure.

<sup>7</sup> This will be based on published sources and a limited number of interviews with primary and secondary publishers.

- What are the substantive risks that they may run related to IPRs and how might these be minimised?
- What are consequences for their own business models?

## Issues Arising around the need for Business Models

1. Do you have to be able to do everything in order to have a decent harvestable resource?

A great many collections have imperfect metadata, and sometimes no metadata at all. Is a workable business model possible for such collections, or is it necessary to have everything properly catalogued before your resources can become part of the transactive life of your organisation?

2. Should you use Collection Level or Item Level Description?

3. Do you need a statement of Service Level for users?

4. Who are the stakeholders?

5. How important is publication of the parameters and character of your metadata, and of the resources available in your eprints archive?

6. Preservation issues - protection and curation of resources – addressed at all by the protocol? Is persistence of the resources addressed by the protocol?

7.

What is the legal status of the eprints in your archive – are they legally eprints, or are they owned by someone else? Is material deposited in an archive owned by the holding institution or the author?

8. Should the regulation of IPR issues be by copyright law, or by the law of contract?

9. Is it desirable that every resource for which you have metadata should be available to users?

10. Do institutions actually want ePrint Archives, or are they in fact looking for something else?

11. Are the open archives and the academic publishing community unknowingly locked into a symbiotic relationship with each other?

12. The Branding and Ownership issue in a world of distributed resources – ‘can I build services on the British Library metadata?’

13. Is the traditional publishing model something apart?

14. How important to the owners of resources is control over the context in which the resource appears?

15. Rights management & Payments – how will this be done on a technical level?

16. Quality Assurance

17. Are our legal systems keeping up with the technology and the pace of change?



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