

## The Deconstructed Journal

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### Part 1 - Introduction

Many of the ideas expressed in this paper are not new. I described the original version of the model that forms the basis of the Deconstructed Journal (DJ)<sup>1</sup> at a meeting held at the Royal Society in 1993<sup>2</sup>. That simple model seemed so obviously a candidate for a new net-based academic publishing model that I expected it to be proposed any moment in the academic literature of library and information science. However, although a great deal has been written over the past four years about the electronic journal, both on the net and in paper form, and often it seemed the author must stumble into my proposed new model if only by accident, I have not seen a model proposed for academic publishing on the net that is quite like the Deconstructed Journal.

### *Competing e-publishing models - past and present*

For examples of the variety of models proposed for academic e-publishing see Harnad (1990, 1996), McKnight (1993), Odlyzko (1995), Piternick (1991), Rowland (1994), and Swinnerton-Dyer (1992). Swinnerton-Dyer (1992) proposed a publishing model heavily influenced by the paper model in operation and with a centralised server. Odlyzko (1995) includes an outline model based on the interactive and less formal possibilities of net-based publishing. Harnad (1990) is concerned mainly with the pre-formal communication stage between researchers, but Harnad (1996) elaborates the earlier model to include a mechanism for peer-review. For a survey of other attempts to replace the Scientific Journal see Lines (1992) and Piternick (1989).

### *An aside - A new Paradigm?*

*I find I have needed to describe my proposed new model (in Part 3 below) from many angles. This is because I am using words (e.g., journal, publishing, article) which have one meaning in the old model and another in the new. This problem of words/concepts changing their meaning when moving from one model to another is typical of a 'paradigm shift' as described by Thomas Kuhn in 'The Structure of Scientific Revolutions', (Kuhn, 1970). Many authors writing in the area of new publishing models have described their work as incorporating a 'paradigm shift', but in many cases their new models are not new paradigms - they are simple (or complex) extrapolations or re-workings of the current model. This*

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<sup>1</sup> I call my model the 'Deconstructed Journal' for two reasons. Mainly because it is just that - it is the roles and attributes of the scientific journal taken apart and distributed across many 'actors'. Also, it is the process by which one moves from the current model to the new model, by 'pulling apart' or 'deconstructing' the current model.

<sup>2</sup> 'E-Journals - Exchange of Experience Meeting', 26 February 1993, The Royal Society, London (organised by the British Library Research and Development Department). I also described variations of this model to attendees at an invited talk to the staff of the Commonwealth Agricultural Bureau - International (CAB-I) on 5 November 1993, and at a Workshop at the National Centre for Software Technology in Bombay, India, on 6 December 1994.

*changing in the meaning of words/concepts during a paradigm shift is not complete proof of such an event - but it is highly indicative.*

### ***The starting point***

Three 'realisations' led me to question the status quo with regard to scientific<sup>3</sup> journals (paper and net-based) and to formulate the DJ model.

#### **1. The continuing effect of the 'paper model' on the design of the current Electronic journals**

The majority of e-journals attempt to maintain the style and organisation of paper journals. In the case of those that parallel existing paper journals this is not so surprising, but it is often true when the e-journal in question is itself only available in e-form.

#### **2. The 'paper model' is wholly inappropriate for an e-journal.**

The 'paper' model constrains and inhibits the inherent flexibility of the network medium, preventing the e-journal from developing into the new primary dissemination tool for the STM community.

#### **3. The scientific journal has existed almost unchanged for 200 years.**

Therefore:

- It must play an important and useful role (or roles) in the scientific research process;
- Any replacement must play the same roles, i.e., satisfy the same needs.

### **Part 2 - Deconstructing the Scientific Journal**

It follows from the second conclusion of item 3 in the previous section that, before designing a new network-based vehicle for scientific information dissemination, we need a detailed breakdown of the roles played by the scientific journal. It is also clear that this analysis must include not just the public or obvious roles, but also the hidden roles which may be as important or even more important.

#### ***An analysis of the roles of the scientific journal***

The main roles are the ones most users (and librarians,<sup>4</sup> etc.) would say are played by the scientific journal.

- *Editorial* - The most obvious role of the journal is the selection of material. This is mainly subject-based, i.e., 'Does this item fall within the remit of the journal and/or would it be of interest to our readers?', although there may also be some quality control element as well.
- *Quality control (Content)* - This is the part played by the referees. A major part of the effort that sets the reputation of a journal is carried out by the referees, but they get very little direct credit (and no payment).
- *Quality control (Form)* - The copy editing and general page design that make a journal 'look' professional is carried out by copy editors and other non-academic professionals (and they do get paid for this work - unlike the referees).

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<sup>3</sup> I am using 'scientific' here, and often elsewhere in this article, as shorthand for 'scientific, technical and medical (STM)'.

<sup>4</sup> An analysis by Maurice Line (Line, 1992) although done for a different purpose agrees with mine in many areas.

- *Marketing (or making aware)* - marketing of the journal to readers and other customers, e.g., libraries.
- *Delivering/disseminating* - the delivery of the physical item (or the information contained) to the purchaser or reader.
- *Conferring recognition of work done* - In terms of importance this ranks first from the point of view of many authors (for some the actual dissemination of the information may rank higher).

#### The 'hidden' roles

In addition to the obvious roles played by the journal it also plays hidden or non-obvious roles which are nevertheless important to the academic research community.

- *Subject defining* - In some cases a journal (the Editorial Board) may help to define the areas it serves. It may do this in two ways:

*Directly* - through invited review papers and/or Editorials

*Indirectly* - through the editorial decisions made.

- *Community defining* - Again, depending on the subject area, a journal may help define a research community through its readership. This is more likely to be true of emerging research areas.
- *Archiving* - Strictly speaking, it is not the role of the journal to archive the results of work done, but the physical objects that are the traditional journal are themselves archived, usually by the customers, mainly academic libraries (at no direct cost to the journal publishers, the authors, or the other researchers in that field).

#### *The journal as 'filter'*

Another analogy for the scientific journal is to see it as a 'filter' (in the optical sense). Looking through this notional filter at the corpus of scientific knowledge one can only see that set of information items relevant to a specific subject. If this analogy is not clear, think of viewing a picture of red, green and blue objects on a dark background through a red filter - only the red objects would be visible. I will return briefly to the implications of this analogy in Part 3.

#### *The beginnings of re-construction*

Reviewing these roles without any commitment to the status quo in academic publishing (in fact with a positive desire to escape the constraints of the current paper-based model) it becomes clear that there is no necessary reason why all these roles should be carried out by, or co-ordinated by, the same organisation, i.e., the publisher. From this realisation one can ask the next question:

*"Is there a publication model that fulfils the roles of the scientific journal, but better matches the functionality of the net?"*

The following section is a description of one such model. It would appear that this is only one of a family of related models each of which could be a positive answer to the above question. The term 'Deconstructed Journal' is, in effect, the name of this particular set of possible new publishing models.

### **Part 3 - The Reconstructed 'Deconstructed Journal'**

What follows is one way of reassembling the elements 'pulled apart' in Part 2, or, viewed another way, it is a way of fulfilling the roles of the scientific journal using a new assemblage of actors and activities.

#### ***The 'New Scientific Journal' - an Overview***

As one might expect, at the core of this new model is a Web<sup>5</sup> site/service<sup>6</sup> similar in structure to a current Subject Gateway<sup>7</sup>. This service contains links to relevant items of interest to its readers (subscribers). The new scientific journal (NSJ) is the visible replacement for the current scientific journal. Some of the important differences between this and the current paper-based and e-journals are:

- The operators of this service do not own, or have any exclusive rights in, the items pointed to.
- A major role of the service is to act as a 'filter' (as described in Part 2 above) between the contents of the net and the user or subscriber - not to be a repository of the said material.
- The operators of this service (the NSJ) may, or may not, arrange the quality control (content) stage of the publishing process.

#### **How a new NSJ is started**

A basic version of the NSJ would be created (or come into existence) in the following way:

- A group (the Editorial Board of the NSJ) would decide a new NSJ was needed.
- They would search the net for relevant items, maybe also announcing on various e-mail lists and USENET News groups, etc, their intention to set up this new NSJ and invite suggestions for inclusion in the first 'issue'<sup>8</sup>.
- Using similar tools (e-mail lists, USENET Newgroups, Web pages combined with Search Engine posting services and Search Engines), plus other information dissemination tools (including hardcopy advertisements) they would announce the availability of the new NSJ.
- The service might be made available 'free' supported by a learned society or public funds, etc, or it might be subscription based with users, or their institutions, paying for access.

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<sup>5</sup> I use 'Web' here as it is the currently available technology - there is nothing implicit in the Deconstructed Journal model that links it to the Web model - any net-based service with a similar functionality could play the role.

<sup>6</sup> It must be remembered, there is no necessary connection between a single site and a single service. A 'site' may contain several 'services', and a service may spread across many sites, e.g. The World Wide Web Virtual Library, so any NSJ could be single- or multi-site.

<sup>7</sup> There is, as yet, no consistent terminology in this area - I am using Subject Gateway to mean a site dedicated to listing links relevant to a particular subject area (e.g. SOSIG for Social Sciences). A Gateway may also contain primary information.

<sup>8</sup> Of course, 'Issue' is an anachronism here - first appearance or manifestation may be a better word - but this is a new complex entity and we do not yet have the correct words for its parts, or even have a completely clear description of its parts.

### ***The NSJ and the DJ***

It is easy to confuse the New Scientific Journal (which replaces the actual Journal in the current model) and the Deconstructed Journal which is the overall model within which the NSJ works. One reason for this confusion is that, in the current model, we do not clearly distinguish between the system that gives rise to a journal and the journal itself, but within the DJ model these differences are deliberately made clear.

### ***Another way of viewing the NSJ and its related 'actors' within the DJ model***

A possibly easier way to see how the DJ model works is to list the various roles that need to be played by this replacement for the current SJ model (as defined by the analysis of the roles of the traditional journal in Part 2 above) and indicate how, and/or by whom, the role is to be carried out within the new model.

#### **The main roles**

- *Editorial* - This is performed by the NSJ as described in the previous section - this would be a gateway-like service on the net which pointed, linked or referred (the exact term is a merging of these three concepts) users to items of interest.
- *Quality control (Content)* - This is an area of radical departure from the current model. In the DJ model the role of the referee organised by the publisher in the current model would be played by independent organisations who would validate or give their 'stamp of approval' to items (articles, sites, services, etc). These could be submitted by the author/producer<sup>9</sup>, the Editorial Board of an NSJ, or an independent agent (literary agent, university, company, etc). These 'Evaluator' organisations could use paid or unpaid referees, or some other mechanism, for deciding whether to give their 'stamp of approval'. The Evaluator organisations would be paid for all or part of their effort by the author, the employer of the author, or others. There are existing organisations that could play this role, for example the learned societies, or universities (in the same way that they currently cross-check the quality of each others courses and degrees). Other independent bodies might be set up to do this. It might be argued that there could be possibilities for corruption or other forms of favouritism, but any such organisations would soon disappear as Evaluators would have nothing to sell except their reputation.
- *Quality control (Form)* - This could be carried out by the author, possibly with the aid of intelligent software (for example, programs like the Wizards in Microsoft Products which aid in the layout or production of a document or presentation, etc.). Other options are local experts (within the institution), external commercial organisations (as one might use a graphic designer for a book), etc. Many universities already have a resident HTML expert who advises on Web page design - this could be the same person or part of the same team, or they could go out to external designers, consultants, etc.
- *Marketing (or making aware)* - The NSJ makes its subscribers aware of the new items of interest. It will probably do this passively simply by being there when they look, but it could be proactive by e-mailing subscribers, alerting them to new material. It could do this in rich

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<sup>9</sup> I use the phrase 'author/producer' to indicate the items on the net are not, and will not, necessarily be in the currently accepted form of the article or book or similar written entity. However, the phrase is awkward so for the rest of this article I will use 'author' even though it is understood the more general phrase is intended.

and complex ways. Some subscribers would have a regular update which would mimic an 'issue', others might only ask to be informed actively of items above some pre-set level of relevance, etc. Although this could be quite flexible it would need to avoid becoming an SDI<sup>10</sup> service for the reasons outlined in 'Community defining' below.

- *Delivering/disseminating* - This is carried out by the network as part of its normal operation.
- *Conferring recognition of work done* - This is a function of the NSJ and the Evaluator organisations. There is nothing in the model to prevent an author having his or her work evaluated by more than one Evaluator and the model positively encourages multiple NSJs to point to the same item since there is no concept of NSJ/item ownership.

The 'hidden' roles

- *Subject defining* - As with the current form of journal the NSJ has two ways to help define the subject it covers:

*Directly* - The NSJ can have invited review papers and/or Editorials. These would form part of the 'value-added service' paid for by the subscribers to the NSJ and would be the only items owned by the NSJ (if the operators of the NSJ so wished). However, it might be in their interest to enter into agreements with related NSJs to share these items.

*Indirectly* - The selection of links listed by the NSJ would automatically be 'subject defining'.

- *Community defining* - An NSJ would help define a community because its subscribers would share the same links to related information. It is because this role is required that the NSJ's active marketing should not be too tailorable. The danger of SDI taken to its logical limits is that each researcher is provided with a unique view of the information on the Web and there is no shared commonality of knowledge. Without this commonality of knowledge we could not have the community activity that is science.
- *Archiving* - This is a thorny area for all forms of network publishing. With the paper version the customers provide the archive, and the publishers the items to be archived. This cannot be the case with the NSJ as the providers of these services do not own the items they point to (with the possible exception of their own review or editorial items). There are many possible models for archiving, for example:
  - The authors' employers do it, e.g., the universities, or other research organisations. They get the kudos (it is part of their research image) therefore they want 'their' papers to be visible and available.
  - Governmental, or inter-Governmental organisations do it (e.g., some branch of the United Nations, or for the members of the EEC, a Europe-wide body).
  - There might be a commercial opening. One could imagine a company which is a little like a pensions company which guarantees availability in the future by using the current fees to pay for the provision of new and existing items on its machines. It may be

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<sup>10</sup> Selective Dissemination of Information

thought that there would be a problem as the amount of stored information grew, but the flow of funds remained constant. However, it is more than likely that storage technology will increase in capacity and fall in cost at a sufficiently great rate to counter this problem. In addition, with sophisticated staging techniques it will be possible to have old and very rarely used items on very cheap off-line storage which is only accessed on demand. This technique is standard practice today with very large collections of data.

### *The NSJ as 'filter'*

This analogy was mentioned briefly in 'The New Scientific Journal - an Overview' above and in Part 2. This view of the traditional scientific journal was one of the steps that led me to formulate the current model of the NSJ. This is the major role of the NSJ, where it is explicit rather than implicit as it is in the traditional journal model.

The filter role could easily be extended so that, in addition to providing links to items submitted, the NSJ could have a team (like an extension to the Editorial Board) that actively scans the network for interesting and relevant items. This 'one-stop-shop' pointer service for all information on the net of value in a specific subject might be the major selling point for the NSJ and the primary reason why a subscription is taken out. An extension of this idea might be that, instead of an author submitting an item to an NSJ, he or she might post a reference to it in some common area concerned with the appropriate subject or subjects, knowing that 'talent spotters' from the NSJs look there for new material.

### *How it might operate - an example*

Another way of illustrating the overall model of the Deconstructed Journal is to consider how it might operate. Here is one possible sequence that would fit within the model:

1. Researcher prepares an 'article'
2. Places it on a visible server
3. Notifies one or more 'evaluator' organisations
4. Revises it in the light of comments until Evaluators give it their 'Seal of Approval'
5. The researcher notifies the relevant NSJs who place it on their 'recommended' list

There are many permutations that could fit within this basic approach within the model, examples are:

- Author -> Archive (University) -> Evaluator (Learned Society) <-> Author -> NSJ (Editorial Committee) -> Link added or rejected (on grounds of relevance)
- Author -> Archive (University) -> NSJ (Editorial Committee) -> Evaluator (Academic) <-> Author -> NSJ (Editorial Committee) -> Archive (Commercial) -> Link added

In the first example the author places the article on the university's server and notifies a learned society that offers an evaluation service - interacts with the evaluators until the 'Seal of Approval' is given, then notifies the relevant NSJ (or NSJs) and the link is added if the article is considered relevant.

In the second example, the author starts with the same action (place article on university server) but then notifies the NSJ editor. The NSJ editor, if interested in the item, notifies an Evaluator organisation which interacts with the author until the 'Seal of Approval' is given, then the author or Evaluator organisation notifies the NSJ. In this case, the NSJ arranges for the final item to be placed on a commercial archive/server. This second permutation more closely mimics the current paper model<sup>11</sup>.

### ***The end-user view***

A possible use scenario may be:

1. User runs a local client program (today it would be a Web client) and links to the NSJ server
2. On initial connection, the user is asked for identification
3. Using this, the server returns a 'front page' that depends in part on when the user last connected, and possibly also on a stored profile.
4. The user views local (to the NSJ) information and/or follows links/pointers from there.

Assuming a functionality at least equivalent to the current Web client/server environment, the user will then be able to view items on screen and/or request copies.

### **Part 4 - Some selected advantages, possibilities and problems**

As one would expect there are many implications and possibilities that follow from this new model, and only a few can be covered in this short article. Many more are covered in a longer article in preparation<sup>12</sup>.

#### ***Problems with the current model 'solved' by the DJ model***

##### Escape from the 'scatter' problem

The 'scatter' problem is when information pertinent to a specific area of research is spread across a number of journals. This is particularly common with emerging research areas as they may not be a specific journal or journals dedicated to the subject. It can also occur with work that straddles current research area boundaries. The NSJ model completely eliminates the 'scatter' problem. To be exact the 'scatter' problem need not exist in the model as no published item is owned by any particular NSJ - so any NSJ can point to any item that the editor feels would be of interest to his/her subscribers.

##### Full grown birth

Any new NSJ that comes into existence can start by pointing to existing items that are relevant to the subject area in question. This again follows from the fact that no item is owned by any specific NSJ.

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<sup>11</sup> This ability for the new model to see the old as a 'special case' is another indicator that this is really a 'paradigm shift'.

<sup>12</sup> This is currently entitled 'A new model for the scientific journal' and, in addition to covering the implications for all the actors in the information delivery chain (including libraries) in much greater detail, it also covers such areas as the history of the SJ and discusses why the current paper-based model evolved as it did.



### Easier publication of new authors/ideas

A well known problem of the refereeing in the current model is that authors with new ideas (especially those involving new theories or paradigms) find it difficult to get published, Schauder (1994). The new model, because it has many, independent evaluators and the possibility of grading, rather than the simple pass/fail (publish/don't publish<sup>13</sup>) approach of the current model, could allow unknown authors with a radical new idea to get published (more correctly 'acknowledged' or 'made visible') more easily.

### *Some new possibilities*

#### A role for smaller learned societies in STM publishing

A quite recent major report on publishing in the scientific, technical and medical areas (Royal Society, 1993), recommended that there needed to be a role for smaller learned societies. Production of an NSJ is ideal here as it requires very little outlay to start and the most important element is expertise.

#### Fading of the primary/secondary publication division

Under the definitions of the current paper-based model, the NSJ is more like a 'secondary' publication rather than a 'primary' publication, since it points to, but does not contain, the actual information item. However, it is the first point of contact, and link, between the subscriber and the information sought. In this it resembles the both primary journal and a secondary bibliographic service.

### **Problems**

#### Acceptance/adoption

The major obstacle to the adoption of the proposed new model is acceptance by the user community - as an earlier writer on this topic pointed out "the introduction of a single innovation in technology cannot be successful until it is accompanied by an appropriate set of social, behavioural, organizational, and institutional innovations." (Goldhar, 1977). Such acceptance will only come about when the professional and funding bodies accept publishing in this model as equal to paper-based or network-based publishing using the traditional model. There is some indication that research funding bodies in the UK will recognise network published items as long as they have passed the usual quality control tests (i.e., selection and refereeing), so one assumes they would accept the new model as long as the quality control was as good.

#### Funding

The second most important obstacle is finding a operational economic model that would fund activities within the new model. Although a detailed consideration is not possible here, the basic funding model assumes:

- The NSJ itself is paid for by institutional or individual subscribers. The simple NSJ model outlined in this article assumes a subscription-based service (like a current SJ), but does not define who will pay. There will be some NSJs that will appeal to the individual subscriber,

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<sup>13</sup> The current referring model does allow for a promising author to have a paper returned with comments for re-writing but the changes required may be such that the originality is lost because the re-write has to be within a format dictated by the referees.

but the majority will provide group subscriptions, possibly using the approach of BIDS<sup>14</sup> at the University of Bath. The users' institution will arrange access and pay the subscription fee in the same way that it would currently subscribe to a journal for the library, or subscribe to BIDS or other networked service.

- The refereeing/evaluating activity is paid for by authors or, more probably, by their employing institutions.
- The archiving activity is paid for by either the authors or their employers (using an insurance or pension or co-operative model<sup>15</sup>), and/or by central/international governmental agencies.

#### Technical problems

There are various technical problems. The following are just two of the more important ones.

- *Identification* - The NSJ will (in most cases) only store the pointer: what is at the other end is beyond its control. To ensure the item pointed to is the one the NSJ intends to 'recommend' to its subscribers some form of verification process will be needed. This will probably involve storing the item in a non-editable form and including some form of 'digital signature'
- *Verification/authentication* - In the same way, the 'Seal of Approval' of an Evaluator organisation would need to be attached to the final item otherwise false claims about its quality could be made or, inadvertently, other documents might gain approval by accident. Again, a digital signature technique might be appropriate.

#### Part 5 - Conclusions

It is proposed that the suggested Deconstructed Journal model, or one of the family that can be formed within its definitions, should replace the current 'paper-influenced' electronic publishing model. There are four main reasons why this is suggested:

- *Better fit* - The proposed model (the re-constructed Deconstructed Journal with the NSJ as the basic element) far better fits the flexibility of the network as a publishing and information dissemination medium. It is a de-centralised model able to change and adapt to changes and developments in the network and its facilities.
- *Solves current problems* -The DJ model solves many of the problems manifested by the current 'paper-related' model (only a few of which were described in section 4 above). It should also be cheaper overall, as there is no large central publisher who needs to extract a profit from the system to maintain the organisation and it's owners/shareholders.

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<sup>14</sup> Bath Information and Data Services. A centralised service based at the University of Bath in the UK which provides access for UK academics to a range of bibliographic databases for a fixed per annum fee irrespective of usage. For further information see <http://www.bids.ac.uk/infomenu.html>

<sup>15</sup> The insurance model involves each institution paying a small sum each year, the pension model is described in Part 3/The hidden Roles/Archiving, the co-operative model is the formation of a large consortium, probably all universities in a country to provide the service for a membership fee.

- *New openings for entrepreneurs* - The 'pulling apart' of the system that forms the basis of the DJ model means there are places for many new actors to play small, medium and large roles within the new model.
- *Shift of power and control* - The DJ model has very important roles for such entities as the learned societies and universities which will give them more control over the academic publishing industry. This will place control back in the hands of those who both produce and use the fruits of this industry.

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