Access to research outputs: a UK success story

How journal publishers and their investments have delivered essential services for researchers that enhance their efficiency and bring significant gains in productivity
Journal publishers deliver an essential and cost effective service to researchers

- Growth in journal publishing is driven by R&D outputs, which increase by 3% annually

- Library funding is outpaced by the growth in R&D outputs

- Journal publishers have invested more than £2bn in digital technologies in the past decade, delivering massive benefits for:
  - Access – for university and non-university researchers
  - Quality of content
  - Productivity of researchers
  - Unit prices for article downloads

- Publishers are investing to deliver the next generation of benefits:
  - Intra-article functionality
  - Inter-article insights, linking to datasets
  - Anti-plagiarism and ethics enforcement

- Publishers are facilitating alternative access models

- Publishing is a key enabler of the UK’s global leadership position in R&D
• 2,000 publishers publish around 1.5 million peer reviewed articles per year in 23,000 journals
• The industry employs (directly) 110,000 globally: 40,000+ in EU, 10,000 in UK
• UK universities spend around 0.5% of their annual budget on journals (£116m in 2008)
• Through support for editorial activity, publishers return 10% or more of their revenue to the academic community

Sources: Scopus, SIMBA, THE, Mark Ware, SCONUL
Why do journal publishers exist?

- First peer-reviewed journal founded in 1665 by Royal Society
- Journal publishing has evolved dramatically since, but its core functions remain:
  - Registration of new research findings
  - Quality assurance through peer review
  - Dissemination globally
  - Archiving in perpetuity

Researchers: which publishing objectives are most important to you?

Publishers exist to provide highly valued services to researchers

Sources: NOP/Elsevier surveys 2005 and 2010
Journal publishing is driven by R&D outputs

• 3-4% annual growth in R&D funding annually drives...
• 3-4% annual growth in number of R&D workers drives...
• 3-4% growth in number of articles and journals published
• From 2004-2008, number of articles published by 113 UK universities increased by 5% per year
  - 2004: 92,095
  - 2008: 112,762

What do journal publishers do?

- Organise editorial boards
- Launch new specialist journals
- 5,000 new editors per year
- 500 new journals launched per year
- 3 million+ article submissions per year
- 2.5 million+ referees
- 3.75 million+ referee reports per year
- 50%+ of submissions rejected
- 125,000 editors
- 350,000 editorial board members
- 30 million+ author/publisher communications per year
- 12 million researchers
- 4,500+ institutions
- 180+ countries
- 1 billion+ downloads/year
- 10 million+ printed pages/year
- 1.5 million new articles produced per year
- 350 years of back issues scanned, processed and data-tagged

Note: industry estimates based on known numbers for a subset of the industry that are then scaled to 100% based on the article share of the known subset.
Publishers have invested heavily to digitise since 2000

- Solicit and manage submissions
- Manage peer review
- Edit and prepare
- Publish and disseminate
- Archive and promote

**Production**

- Production Tracking Systems
  >£50 million
- Electronic Warehousing
  >£60 million
- Other support and related systems
  >£300 million

**Author Submission & Editorial Systems**

- >£70 million

**Electronic Platforms, e.g.**

- ScienceDirect
- Wiley InterScience
- Highwire
- Scopus

- >£1500 million

**Publishers have invested heavily to digitise since 2000**

- >£2+ billion

• The journal industry has invested £2+ billion since 2000

Figures in current (2009) UK pounds using gdp deflators
Publishers evolved new pricing models to expand access

Print

- Core collections of institutional print journal subscriptions
- Annual price increases driven by
  - 3-4% annual growth in articles, higher in expanding subject fields
  - 3-4% annual inflation

Late 1990s

P+E and E-only

- “Core” collection plus fee for Electronic access to subscribed titles
- Annual price increases driven by
  - 3-4% annual growth in articles, higher in expanding subject fields
  - 3-4% annual inflation
  - the technology to support 20%+ annual usage growth
- Major volume discounts to access previously unsubscribed-to titles
- Additional discounts for E-only
As a result, most customers now access journals electronically

Benefits

For researchers
- Remote, desktop access
- Fast search
- Interlinked articles
- eFunctions, eg eMail alerts
- Links to datasets

For librarians
- Easier collection management
- Usage data per journal
- Reduced storage space
- Staff efficiencies

Source: “E-journals, their use, value and impact”, 2009 RIN/Ciber
UK university researchers are highly satisfied with access to journals

![Ease of access to research content graph]

- Market research reports
- Original research articles in journals
- Review papers in journals
- Patient details
- Patent information
- Vendor white papers
- Legislative/Regulatory info
- CME/Educational content
- Technical reports from govt
- Professional/Trade pubs
- Scientific/tech stds
- Doctoral theses/dissertations
- Conference proceedings
- Reference works
- Clinical guidelines

PRC study: Survey of access to professional and academic information in the UK, August 2009 – companion report
Globally researchers are highly satisfied with access to journals.

Access to research articles by region:

- North America 97%
- Western Europe 94%
- Eastern Europe 84%
- Middle East 85%
- APAC 91%
- Latin America 88%
- Africa 78%

Source: PRC global study (forthcoming)
UK universities access more titles and pay less per title accessed than in 2004

What UK universities get

Number of journals accessed
Average journals per institute

+7% per year

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tr>
<td>Number</td>
<td>8,391</td>
<td>9,022</td>
<td>9,601</td>
<td>10,615</td>
<td>11,058</td>
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What UK universities pay

Amount paid per journal accessed
In constant 07/08 currencies (Index - 2004=100)

-3% per year

<table>
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<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
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<tbody>
<tr>
<td>Amount paid</td>
<td>100</td>
<td>94</td>
<td>91</td>
<td>90</td>
<td>89</td>
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</table>

UK universities now access 32% more journals than in 2004, and pay 11% less per journal accessed

Source: Based on SCONUL data (Ciber analysis of 113 UK Universities)
As usage has exploded, effective price paid per article downloaded has fallen.

**What UK universities get**

- Full text article downloads
  - Average per institute

<table>
<thead>
<tr>
<th>Year</th>
<th>Downloads</th>
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<tbody>
<tr>
<td>2004</td>
<td>432,693</td>
</tr>
<tr>
<td>2005</td>
<td>632,758</td>
</tr>
<tr>
<td>2006</td>
<td>772,600</td>
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<tr>
<td>2007</td>
<td>930,415</td>
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<tr>
<td>2008</td>
<td>1,134,165</td>
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</table>

  +27% CAGR

**What UK universities pay**

- Effective price paid per article downloaded
  - GBP (in constant 07/08 currencies – gdp deflator)

<table>
<thead>
<tr>
<th>Year</th>
<th>Price (£)</th>
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<tbody>
<tr>
<td>2004</td>
<td>1.19</td>
</tr>
<tr>
<td>2005</td>
<td>0.91</td>
</tr>
<tr>
<td>2006</td>
<td>0.83</td>
</tr>
<tr>
<td>2007</td>
<td>0.77</td>
</tr>
<tr>
<td>2008</td>
<td>0.70</td>
</tr>
</tbody>
</table>

-12% CAGR

- UK universities downloaded over 120 million articles in 2008, 160% more than in 2004
- The effective mean price paid per article downloaded in 2008 was 70 pence

Source: Based on SCONUL data (Ciber analysis of 113 UK Universities)
Benefits are realised at the individual institutional level

Source: SCONUL
UCL study shows e-journal usage drives researcher productivity

- "Doubling in downloads, from 1 to 2 million, is statistically associated with dramatic - but not necessarily causal - increases in research productivity"

- Papers up 207%

- PhD awards up 168%

- Research grants and contract income up 324%

- Even stronger as downloads increase further

Source: “E-journals, their use, value and impact”, 2009 RIN/Ciber
As a result, UK university researchers ‘punch well above their weight’

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The UK’s share of global science

- 3% of global funding for research
- 1% of population
- 7.9% of papers
- 11.8% of world citations
- 14.4% of world’s most highly cited

Source: Royal Society, “the Scientific Century” 2010
Non-university researchers are satisfied with access to journals

Ease of access to journal articles (% rating Very Easy or Fairly Easy)

- SMEs: 70.9
- Large company: 82.4
- University/College: 93.9
- Hosp/ Med sci + Non-Gv Pub Hlth: 78.3
- Research Inst + Gov’t: 84.8
- Other: 69.0

Publishers and other stakeholders are working to understand and close remaining gaps

PRC study: Survey of access to professional and academic information in the UK, August 2009 – companion report
Publishers are evolving licensing models to extend access to non-university constituents further

**Corporations, SMEs**
- GSK
- GlaxoSmithKline
- BAE Systems
-.bp.

**Customised access and pricing mechanisms**
- Corporate editions
- Article choice
- Pay per view
- Sponsored articles

**Hospitals and medical schools**

**Customised access and pricing mechanisms**
- Medical collections
- Article choice
- Pay per view
- Sponsored articles

**Research institutes**
- National Institutes of Health
- Wellcome Trust
- Research Councils UK

**Customised access and pricing mechanisms**
- Article choice
- Sponsored articles

**Individuals**

**Customised access and pricing mechanisms**
- Basic functionality pay per view, e.g. Patient Research, Deepdyve
- Article sponsorship
Information philanthropy is further broadening access globally

- **PatientInform** provides patients with access to summaries of journal articles and links to full-text: 19 different publishers and STM and PSP organisations with annual cost of $110k.

- **PatientResearch** provides patients and carers access to articles in 100+ medical journals for a minimal processing fee.

- **Research4Life** provides developing countries with free / low cost access to peer-reviewed content to over 8,100 scientific journals, books, and databases.

- Across three programmes, over 350 publishers provide free / low cost access to over 3,000 institutions across 108 countries.

- Publishers engage with visually impaired and disabled users to make accessibility enhancements to products and websites.

- **AccessText Network**, supplies resources to support the use of textbooks and this is supported by publishers including Elsevier, Wiley-Blackwell, McGraw-Hill Education and Pearson Education.
Publishers are continuing to invest:

1. Enriching and enhancing articles

**Article Enhancement (e.g. Article of the Future)**
- Graphical abstracts with main message of the paper.
- Hierarchical presentation of text and figures.
- Alternate views to hide or show experiment details.
- Real-time reference analyses for citation exploration.
- Interactive to assist in navigating the article

**Visualisation**
- Peer-reviewed video journals
- Searchable image databases using semantic linking
- In-line video to enhance article content (techniques and demonstrations)
- Multiple platform support

**Social Networking**
- Online community sites facilitating discussion and sharing research findings, techniques and methods
- Linked in journal and book content into community
- Supports continuous learning, CME and virtual conferences

**Mobile Technology**
- Journal, book and database content on mobile devices
- Search and browse articles
- Create alerts and citation analysis
- Save favourite articles information and add notes
- Share result information via Email or Twitter
- News feeds and RSS technology
Publishers are continuing to invest:
2. Tools to derive insights across all articles

Text Mining Tools

- Publishers are developing data and text mining tools with partners to extract semantic connections within journal and book content
- Working with partner to link to datasets, e.g. EMBL, Pangaea
- Researchers want to save time searching and spend more time analysing and experimenting
- Solutions help to discover ideas and new uses for technologies

Research Performance Measurement Tools

- Products that helps decision makers in institutions and governments analyse research performance and emerging areas of science
- Identifies drivers of competitive research positions and strengths.
- Data derived from publication and citation analysis
- Matching of output by authors and institutions
- Intuitive application of article-level classification and bibliometrics, through partnership with industry researchers
Publishers are continuing to invest:

3. Anti-plagiarism and ethics enforcement

- Cross-publisher initiative with CrossRef to detect instances of plagiarism in scientific articles
- Annual investment from publishers of membership and article processing fees

- Provides online forum for publishers or journal editors to discuss issues regarding scientific and peer review integrity

- Publishers have introduced the Rightslink reprints and permission system to enable authors to have permissions for content use to be enabled online and receive instant permissions.
Key issue: university library funding outpaced by R&D outputs

- Libraries in 2008 received only 2.7% (net 2.4%) of UK universities' budgets, down from 3% in 2004
- Library funding is outstripped by R&D funding and outputs, and by total university expenditures
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