



# INFORUM 2010

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Prague

University of Economics  
(Vysoká škola ekonomická)  
New Building



# 10 Hypotheses about the Current State and the Future of Scientific Publishing

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| ① INTRODUCTION |  |  | ② 10 HYPOTHESES |   |   |   |   |   |   |   |   |    | ③ SUMMARY |  |  |
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Introduction

Hypothesis 1 - 10

Summary



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SUMMARY

# Aspects of Scientific Publishing

- Quality/Peer Review
- Certification
- Publication
- Impact Factor
- Selection
- Accessibility: Print/Electronic
- Linking
- Full text retrieval
- Browsing vs. Information retrieval
- Career Advancement/Funding for Universities
- Patents
- Open Access

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Hypothesis 1

Clear Objectives



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# Objectives of Scientific Publishing:

Quality of the academic education  
Quality of the scientific research



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Hypothesis 2

The BIG Questions  
stay the same



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Platon (\* 428 B.C.)

## Platon's Academy



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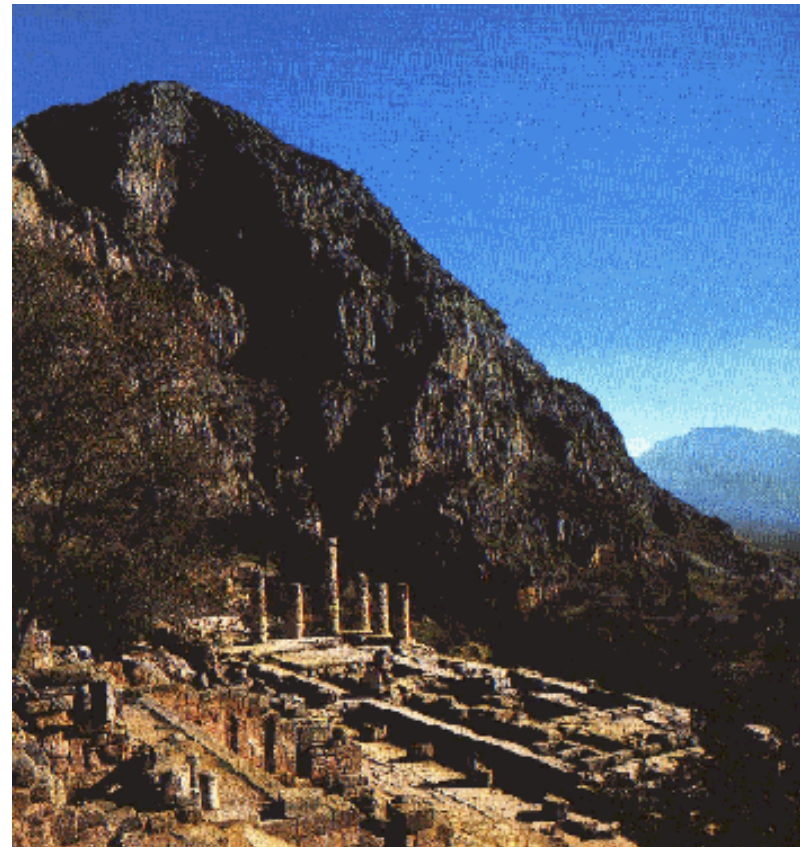
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# Know Yourself!



Temple of Appolon, Delphi

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Francis Bacon (1561 – 1626):

*...nam et ipsa scientia potestas est.*



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Facts/Data

Information

Knowledge

Was kann ich wissen?

Was darf ich hoffen?

Was soll ich tuen?



*Immanuel Kant*

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Hypothesis 3

The Future started in 1936



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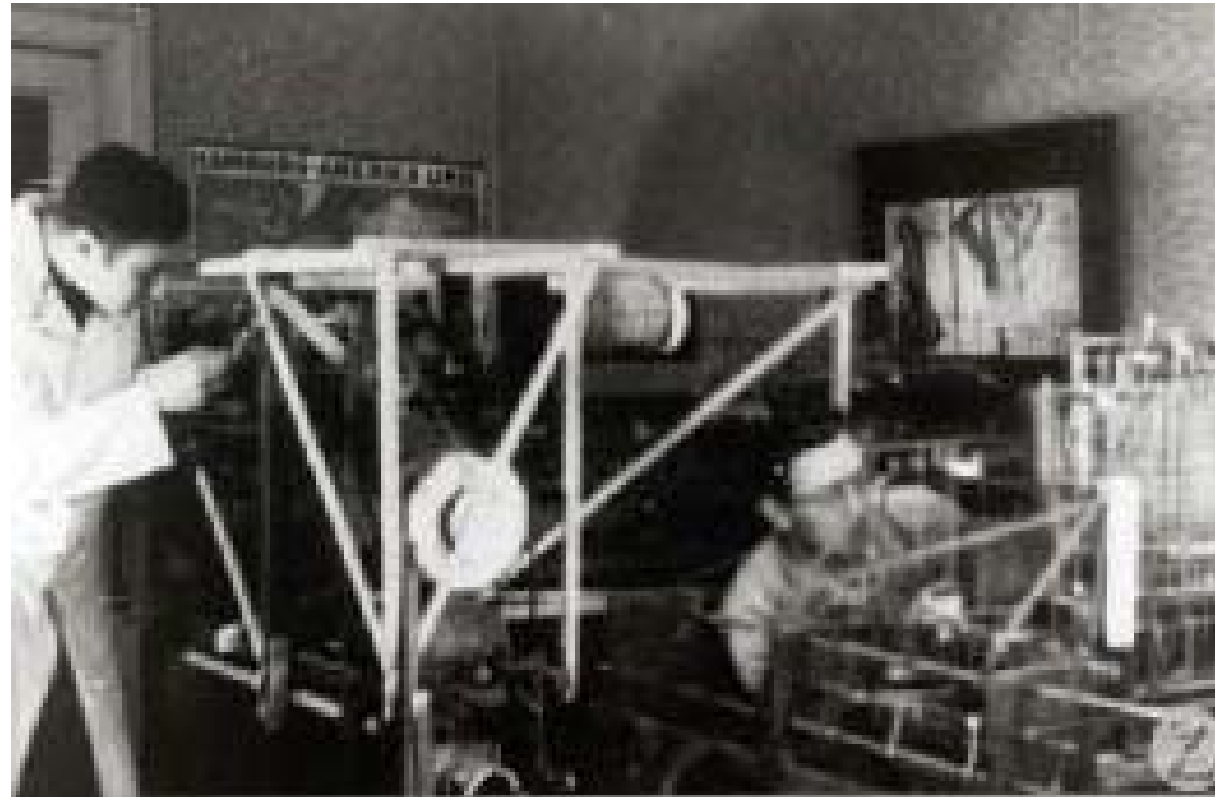
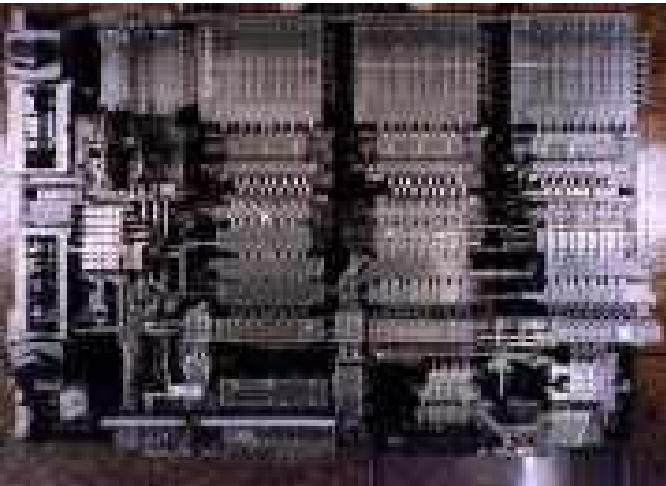
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1936



Konrad Zuse develops  
the first computer

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# 1986 Tim Berners-Lee invents the internet



*[http://www....](http://www...)*

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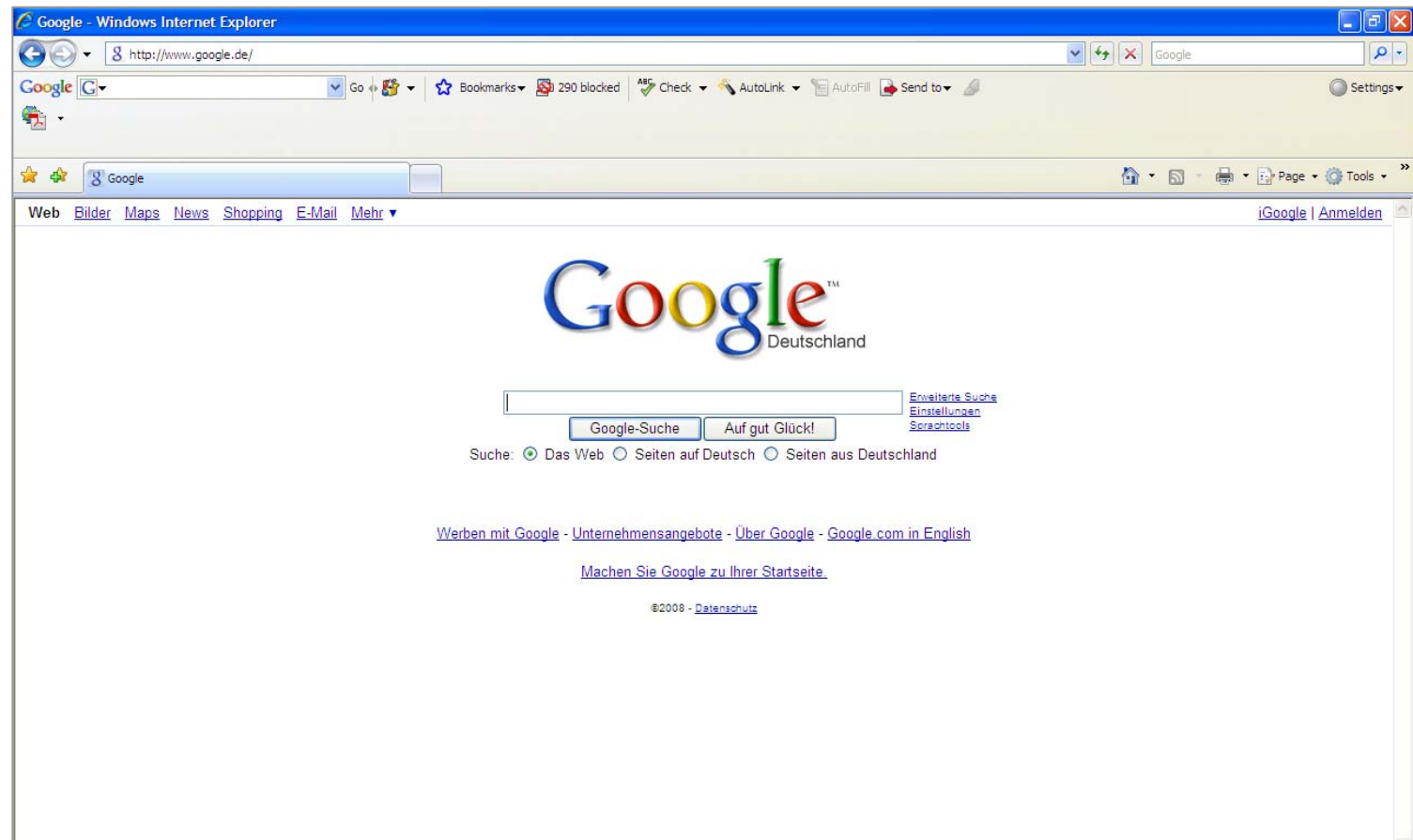
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# 1998 Foundation of Google



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Hypothesis 4

Change has many  
dimensions



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# Change

Information Avalanche

New Channels

Changing Media Usage Patterns

New Competition

Budgetary Restrictions

Role of Libraries



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Hypothesis 5

The underlying economics  
are quite stable



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# The STM-Market

2.000 Publishing Houses constitute the STM-Market:

Scientific Societies → ca. 30%

University Presses → ca. 4%

Independent Publishing Houses → ca. 64%

„The *stm* report: An overview of scientific and scholarly journal publishing “  
September 2009

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# The STM-Market

STM Publishers employ worldwide  
110,000 – 120,000 people.

„The *stm* report: An overview of scientific and scholarly  
journal publishing “  
September 2009

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# The STM-Market

25,400 scientific journals publish annually  
approx. 1.5 million papers.

„The *stm* report: An overview of scientific and scholarly  
journal publishing “  
September 2009

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# The STM-Market

> 90% of scientific journals are available online.

1.5 billion scientific papers are downloaded each year.

„The *stm* report: An overview of scientific and scholarly journal publishing “  
September 2009

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# The STM-Market

Annual Growth Rate of the Number of

Published articles: 3% 

Scientific journals: 3.5% 

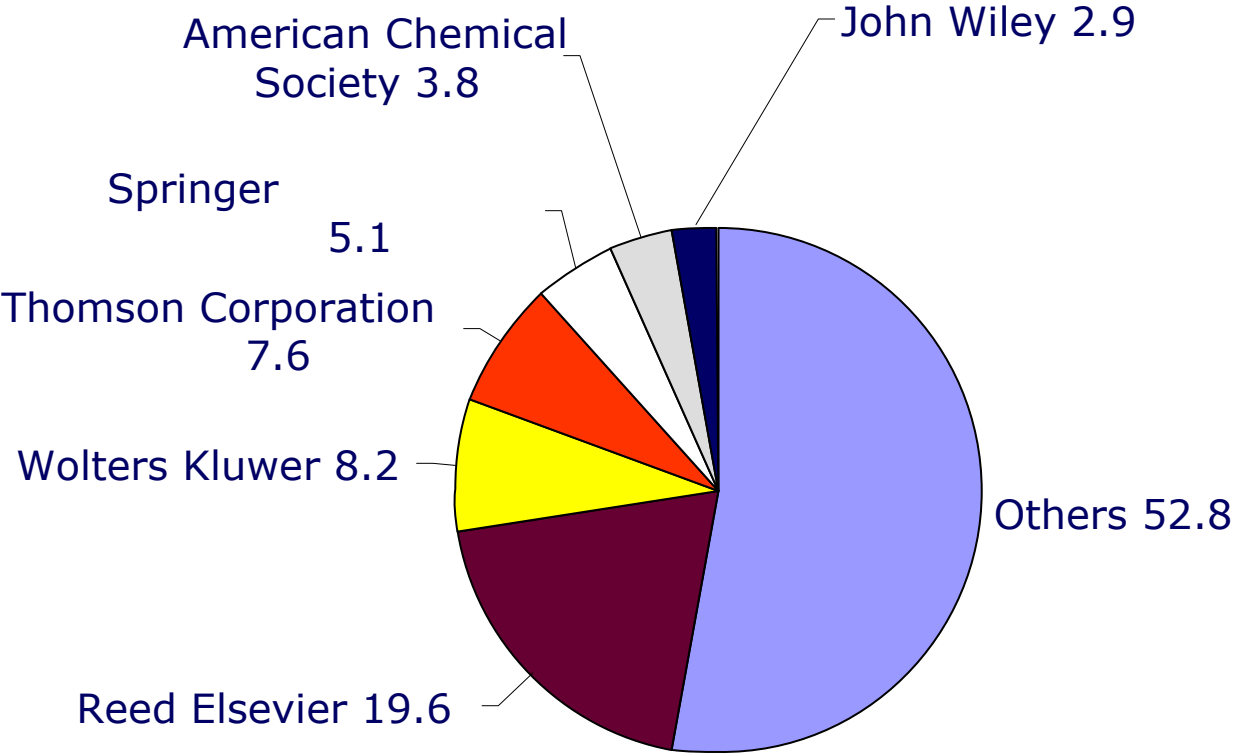
Researchers: 3% 

(Currently: 5.5 million researchers worldwide)

„The *stm* report: An overview of scientific and scholarly  
journal publishing “  
September 2009

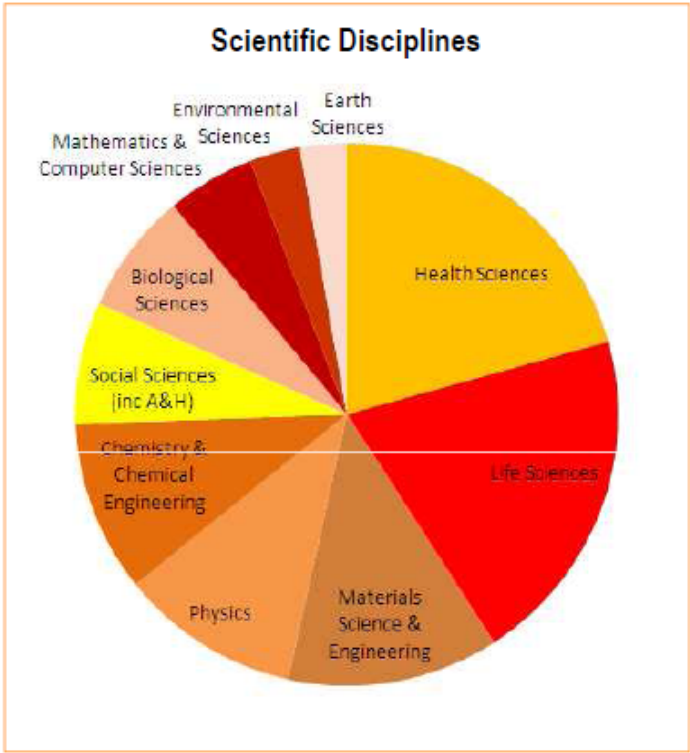
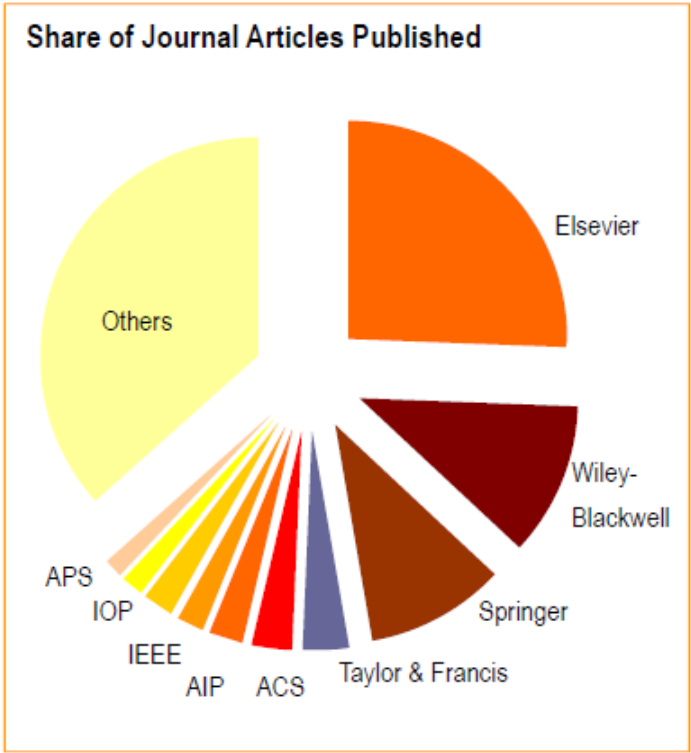
# The STM-Market

Market Share 2001 (%)



# The STM-Market

## Market Share 2010



Source: STM publishing in 2010; PA, stm, ALPSP

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Hypothesis 6

The competitive arena  
will become more  
demanding



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Google books

libreka!  
der volltext-finder



amazon.com

Project  
Gutenberg

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Hypothesis 7

We have not looked at the  
important cost factors



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## Global Costs of Undertaking and Communicating the Results of Research Reported in Journal Articles

|                              | £bn   |
|------------------------------|-------|
| Costs of Research Itself:    | 116.0 |
| Publishing and Distribution: | 6.4   |
| Access:                      | 18.6  |
| Reading:                     | 34.0  |
| Total Costs:                 | 175.0 |



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Hypothesis 8

Coverage and Selection  
becomes more critical



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## Grey Literature

British Library Document Supply Centre (BLDSC):

1992: 3 million documents

2002: 17 million documents

[http://www.bl.uk/reshelp/atyourdesk/doc  
supply/collection/index.html](http://www.bl.uk/reshelp/atyourdesk/docsupply/collection/index.html)

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# STN

- More than 200 international databases in science, technology and patent information, incl. more than 700 million entries
- Online Information service with common user interface to provide global access to all databases:
  - Chemistry, Toxicology
  - Pharmaceuticals, Medicine, Bioscience and Biotechnology
  - Engineering, Materials
  - Energy and Environment
  - Physics, Computer Science
  - Patents



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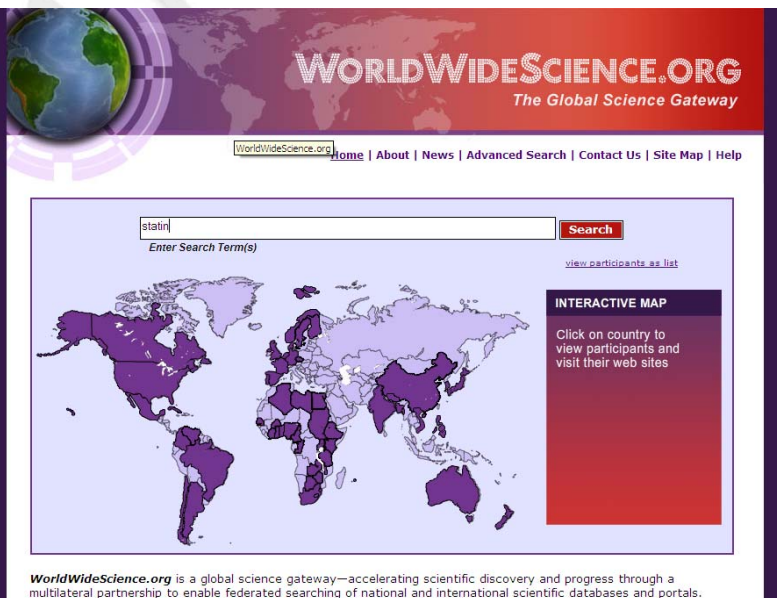
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## Deep Web

- The vast majority of science information is in databases within the deep Web – or the non-Googleable Web – where popular search engines cannot go



WorldWideScience.org is a global science gateway—accelerating scientific discovery and progress through a multilateral partnership to enable federated searching of national and international scientific databases and portals.

- **WorldWideScience.org** was launched in June 2007 and now searches 32 portals from 44 countries

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## Bibliographic Databases

| Database         | Coverage              |
|------------------|-----------------------|
| Pubmed           | >17 million articles  |
| Web of Knowledge | > 15 million articles |
| Scopus           | > 33 million articles |
| Google Scholar   | no information        |

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$$\text{Value} = \text{Benefit} / \text{Price}$$

$$\text{Benefit} = [(x \sum_i \mathbf{F}_i w_i + y \sum_i \mathbf{E}_i w_i) \cdot \sum_i \mathbf{C}_i w_i] / (x + y)$$

With:

**F** = Functionality,

**E** = Ease of Use,

**C** = Coverage,

*i* = individual subelement,

*x*, *y* = the weightings for functionality  
and ease of use, respectively,

*w* = weighting of individual subelement.

A Framework for the Evaluation of Chemical Structure Database  
J. Chem. Inf. Comput. Sci. **2001**, 41, 1131-1140

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Hypothesis 9

Certification and Publication  
are different things



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# Certification



Mene mene tekem u-pharsin

You have been weighed  
on the scales and found  
wanting.

*Belshazzar's Feast*  
Rembrandt (1635)

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*Roosendaal and Geurts 1997*

## Registration

which allows claims of precedence for a scholarly finding.

## Certification

which establishes the validity of a registered scholarly claim.

## Awareness

which allows actors in the scholarly system to remain aware of new claims and findings.

## Archiving

which preserves the scholarly record over time.

## Rewarding

which rewards actors for their performance in the communication system based on metrics derived from that system.

Author's  
Benefit



# Certification



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# Publication



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## Hypothesis 10

# We need new yardsticks

- Usage Statistics 
- Impact Factors, h-Index etc.
- Productivity of subscribing institutions and researchers



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Louis XVI:  
„Is this a revolt ?“



Duc de La Rochefoucauld-Liancourt:  
„No, Sire, this is a  
revolution.“

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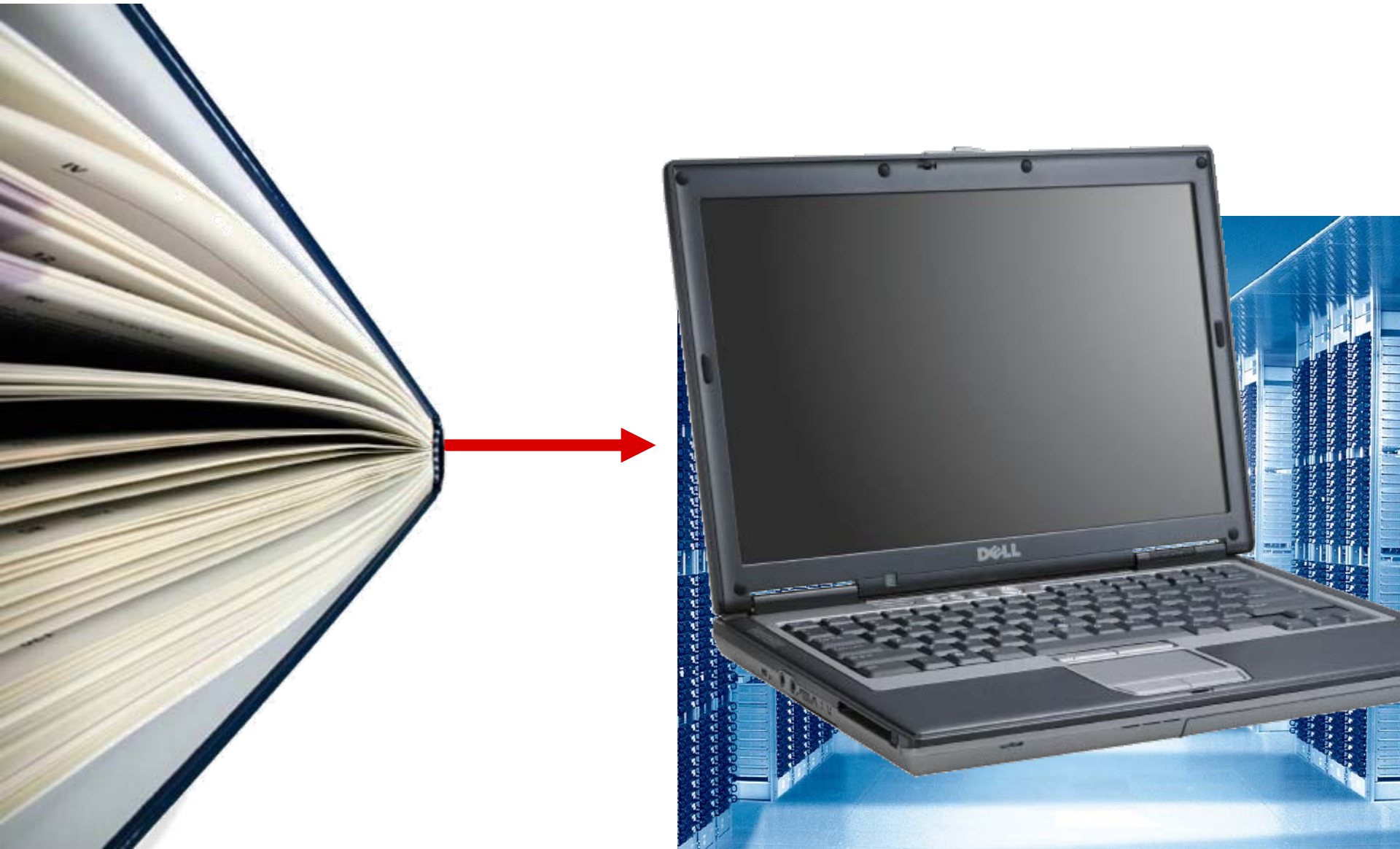
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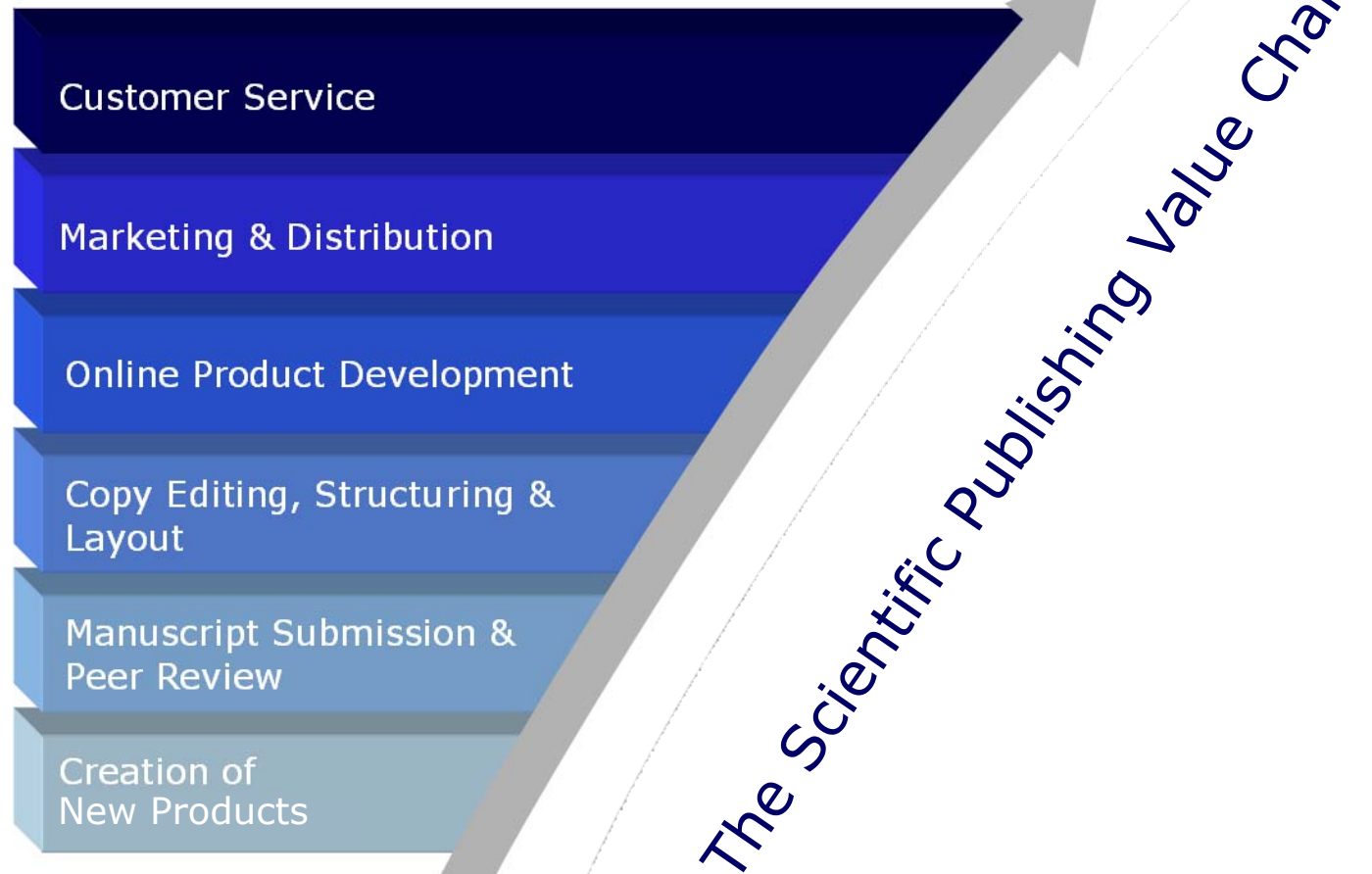
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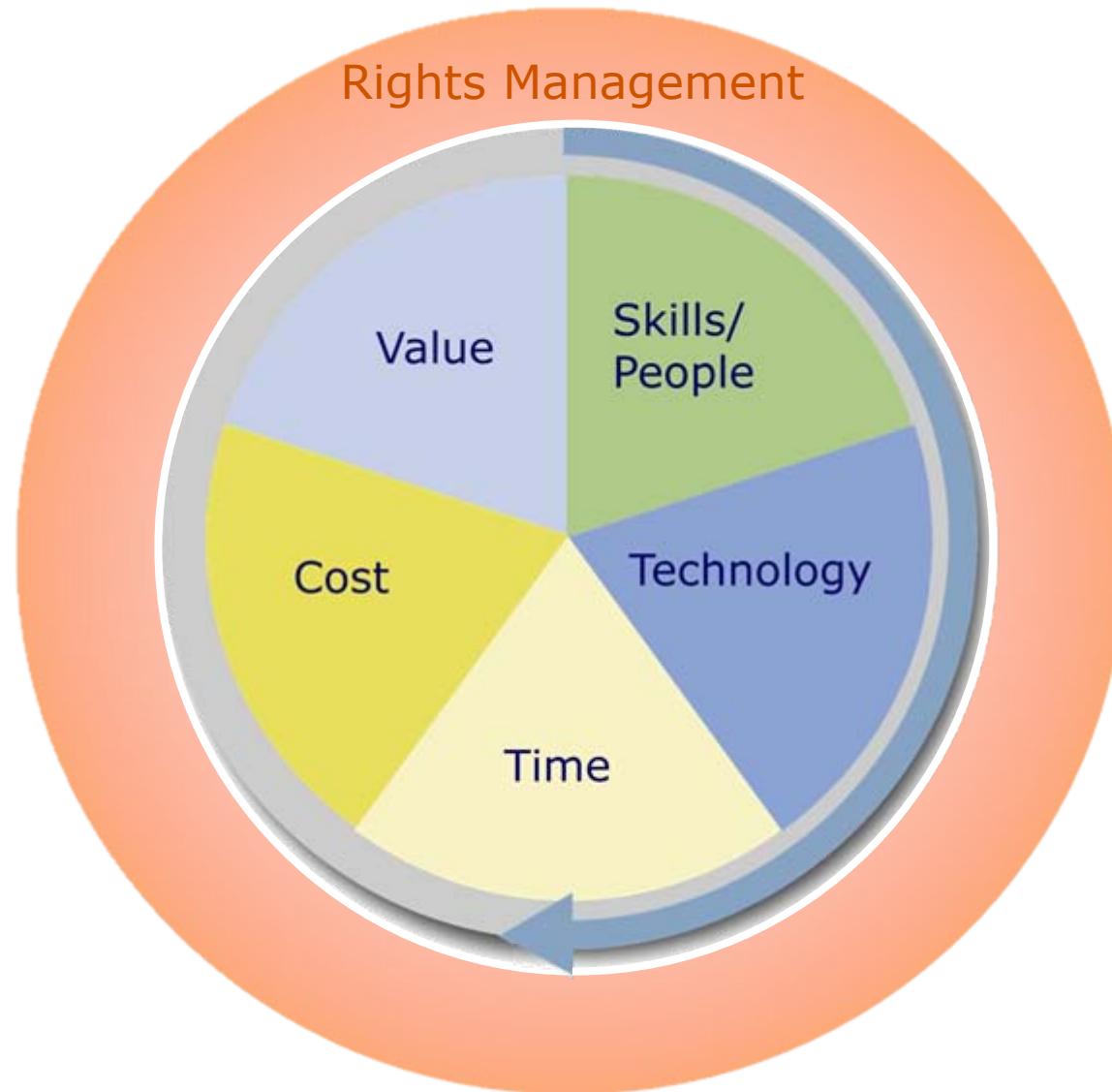
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Thank You!



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