

The Future of the communication system of science

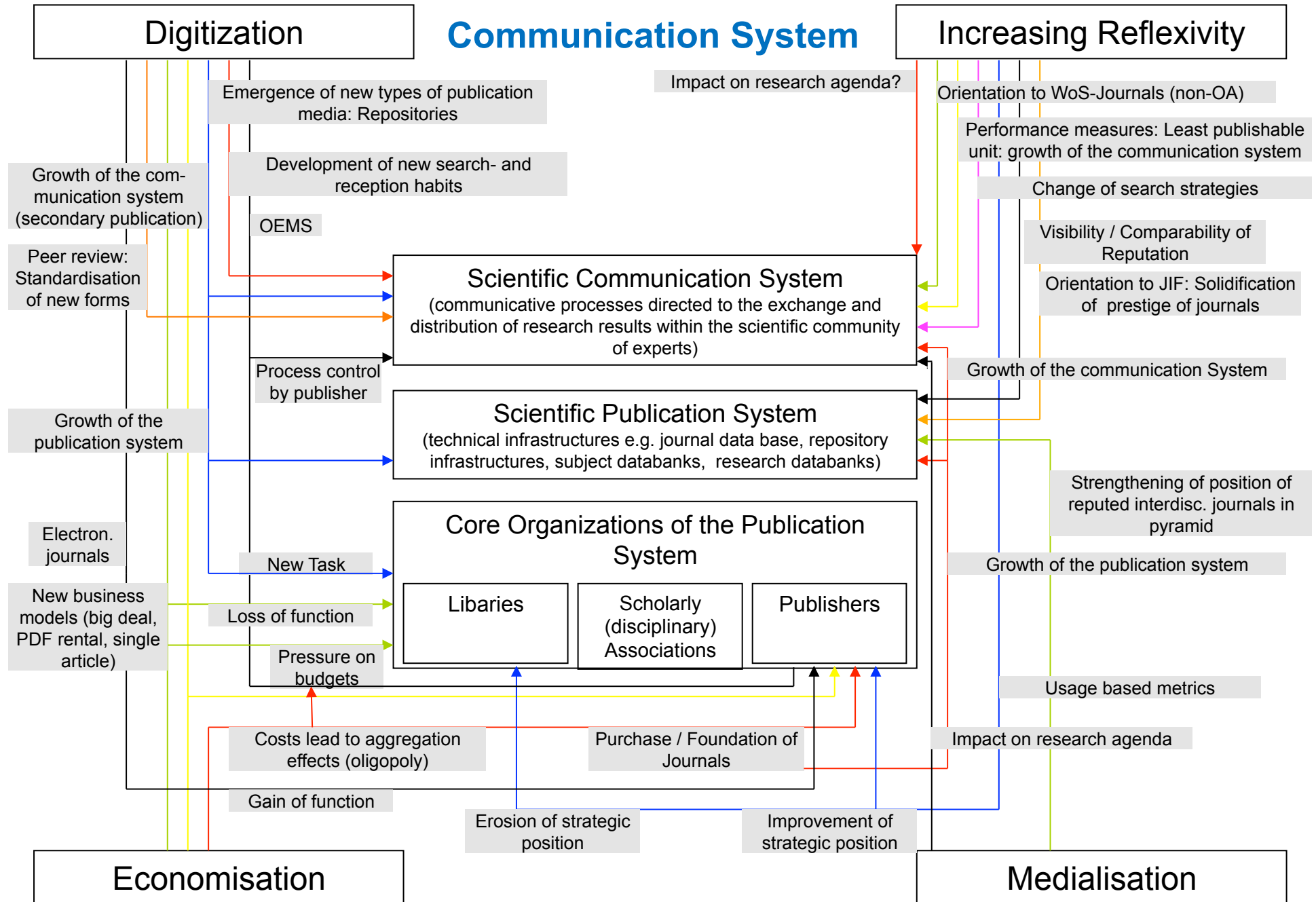
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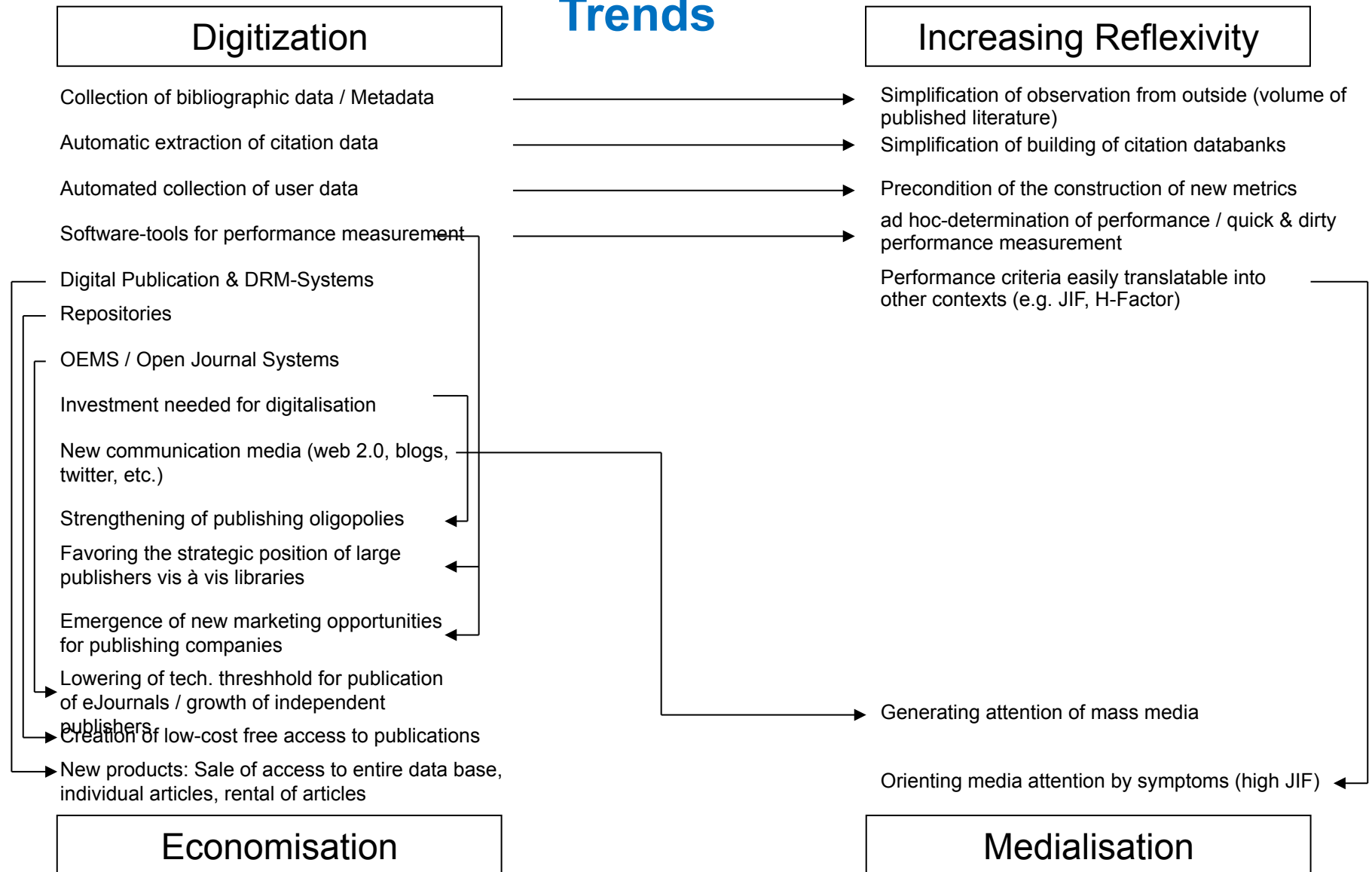
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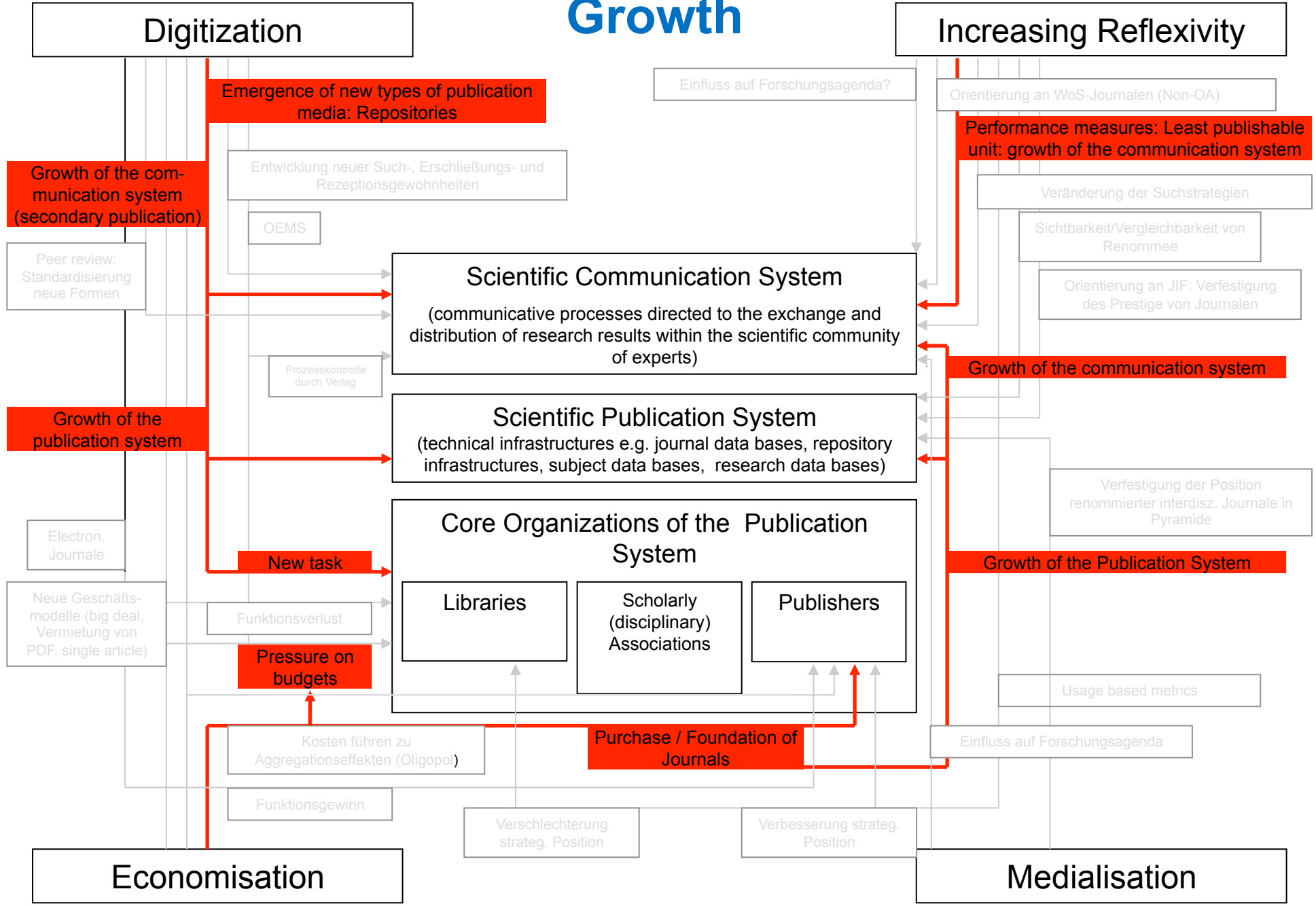
Communication System



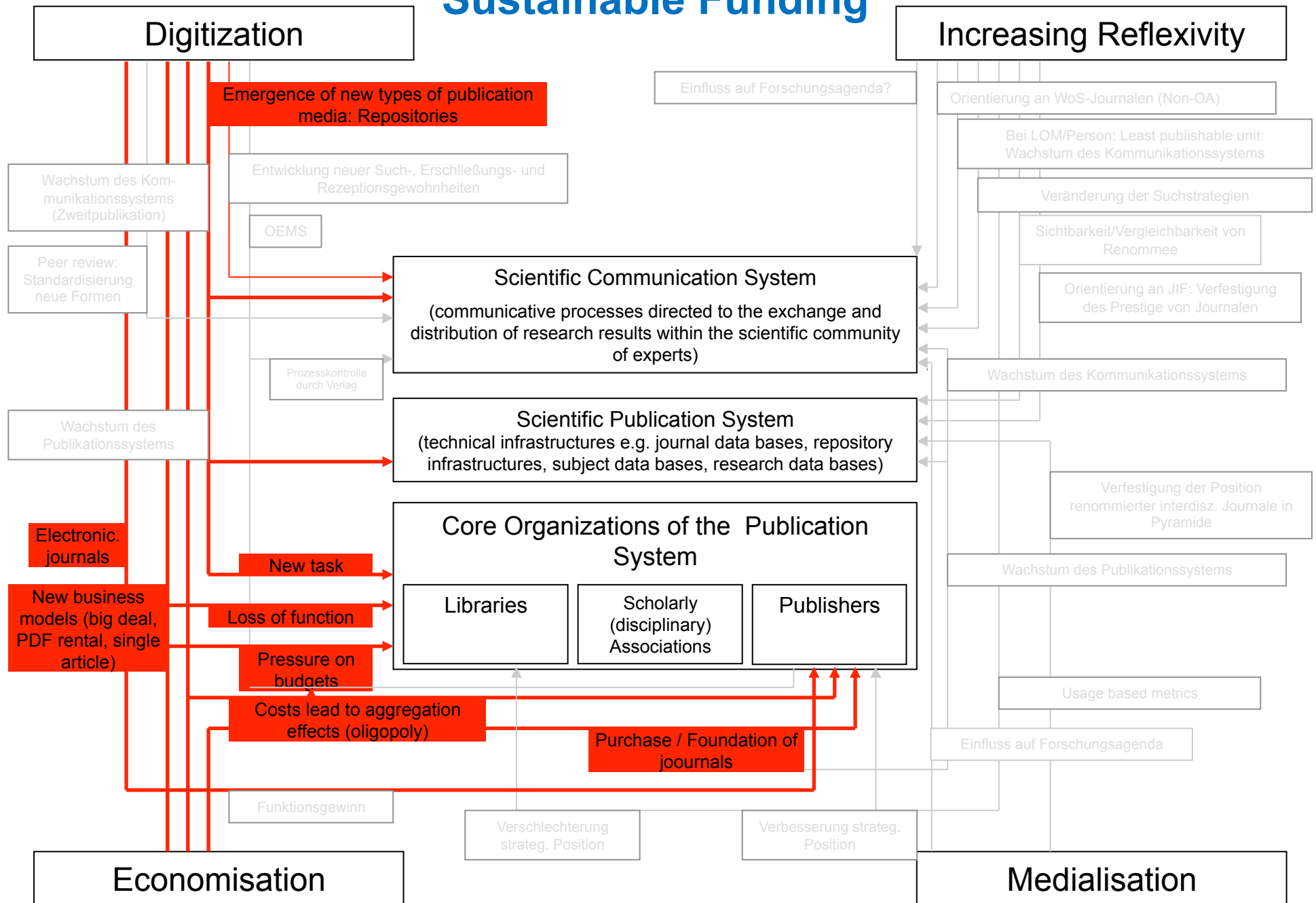
Co-Action of the four Trends



Growth



Sustainable Funding

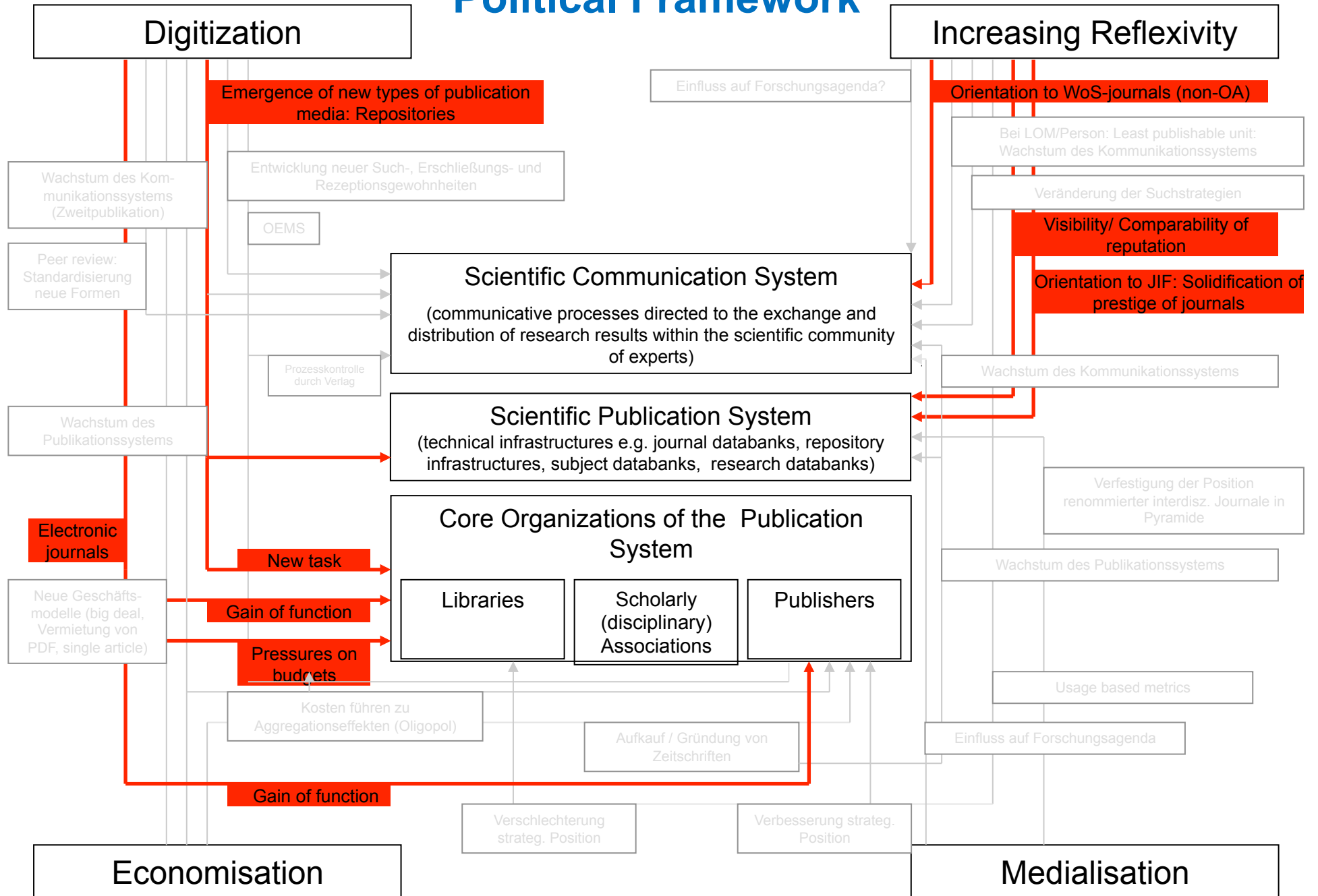


Models of Financing Communication in Science

- traditional subscription model
- Golden Road Open Access based on APC
- Golden Road Open Access based on institutional funding
- Green Road Open Access – secondary publications in repositories

These models have to be compared systematically for their advantages and disadvantages with respect to a sustainable financing and their suitability for other media of publication such as books (for the social sciences and humanities)

Political Framework



Elements and impact of political framework

Many policies and regulatory measures affect the communication system of science

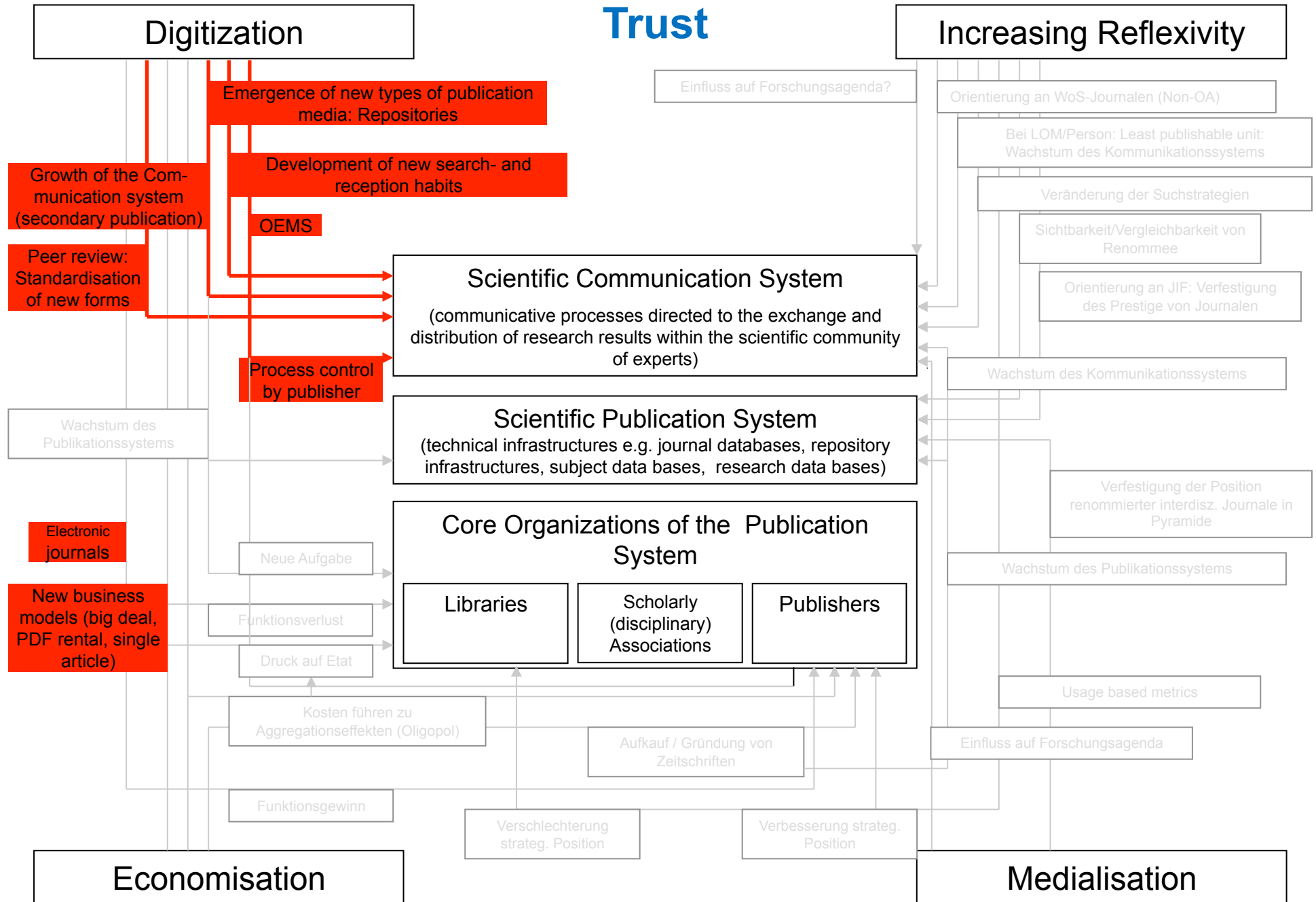
- Copyright and intellectual property rights
- Open Access-policies and respective support measures
- Governance by performance measures and evaluations

They may and do have conflicting objectives

1) efforts to support foundation of OA journals to create alternatives by weakening commercial journals are counteracted by performance measures based on W of S publications that lead to stabilisation of position of established journals in reputation hierarchy

2) Major conflict exists between copyright law and OA policy. Former protects rights and investments of publishers, latter responds to norm of openness in science.

Trust



Effects on trust

Trust is a vital element of the scientific communication system – it is affected in several ways by new IT technology:

- Linking publications and research data and free accessibility create means to document and control research results better than ever before – creates trust
- Funding of journal through APC may lead to economic criteria influencing publication decisions next to scientific ones – undermining trust
- Repositories broaden scope of what is considered scientific publication. In some fields this leads to scepticism towards repositories (i.e. OA)

The crisis of academic libraries*

- EC: price hikes between 200% und 300% 1975 - 1995 (EC 2006: 16)
- Similar for US: 1986-2003 (Panitch/Michalak 2005)
- Expenditures of Bavarian libraries: 98% to 259% for same or decreasing number of journal subscriptions between 1988 and 1998
- Average price increases 1986 to 2006 between 5-8% per year (Kirchgässner 2008)
- 2006 - 2007 close to 8% price increase, for 2008 9-10%, for 2009 7-9% and for 2010 again 7-9% increase (Boni 2010)

* Literature report on state of research on OA by N. Taubert, DFG Project

Causes

1) Growth of volume:

- Between 1940 und 1950 science has entered „the mid-period of logistic growth“ (de Solla Price 1963: 42), i.e. exponential growth of the number of publications and establishment of the journal system.
- Decreasing growth rate of scientists is counteracted by effects of performance measures stimulating splitting of publications
- In addition publishers buy and establish new journals to enlarge their portfolios
- Since the mid-1980s library budgets have remained fairly constant and cannot accomodate growth rate. Publishers react with price increases to loss of subscriptions to keep profit margin

Causes

2) Peculiarities of the market:

a) Strong concentration of publishing companies – oligopolistic structure

•**Elsevier**: 1.250 journals in 2011 in Science & Technology and Health Science; 2,058 billion pounds turnover

•**Wiley**: 1500 journals 1,742 billion \$ turnover, net profit (after taxes) 9,86%

•**Springer Science+Business Media**: over 2000 journals, 2011, 875,1 mio. €. before taxes 35,80%.

Causes

2) Peculiarities of the market:

b) inflexibility of demand

- scientific journals are highly individual, specifically directed to one field, with a particular reputation. They publish ,original' articles. Thus, they are ,must haves' and cannot easily be replaced

c) non-market character of demand

- not scientists but libraries act on demand side. Scientists can act rationally (but irresponsibly) as they can ignore cost implications

Consequences

- Since mid-1990s development toward electronic publishing with the promise of cheaper journal subscriptions
- Publishers raised prices by 15% p. a. claiming high investment costs for digitization
- Libraries cancelled dual subscriptions and distributed journal articles electronically
- Publishers responded with new price hikes and new distribution models: ‚bundle deals‘ and ‚big deals‘ sold to library consortia
- Disadvantage for libraries which cannot cancel individual journals. At the cost of humanities and social sciences Monographs and edited volumes are first to go

The issue of access

- Surprisingly, numerous polls among scientists seem to show that a majority among them does not have any problem with access to publications (2009 93% asked see access as fairly easy or very easy; Ware 2010)
- However, 84% disagreed with the statement: „There is NO problem with access to scientific publications in Europe“ (European Commission 2012a: 17) – BUT: respondents came from a non representative sample
- So „is there really NO problem with anything?“ (Meadow/Campbell/Webster 2012: 194)

Perspectives and uses of open access

- Harnad et al. report more than 2 millionen research papers – mostly secondary publications of contributions from non-accessible journals – in over 400 freely accessible archives (2008: 38) – **green road OA**
- 2003 about a third of all articles from the most important physics journals as secondary publications in **arXiv** (Swan/Brown 2005: 3)
- Articles from High Impact Journals accessible above average via **green road OA**
- Number of **golden road OA** -journals rose from 1.400 in 2005 (Morrison 2005: 4) to 2.500 in 2007 (Swan 2007: 200), ca. 10% of entire volume of journals

General assessment

- Green Road OA more important form; but large differences between fields: high share of papers available in physics, mathematics, computer science, economics
- Share of golden road OA is still small. Except for much cited examples PLoS Biology, PLoS One journals are still young and have to establish their reputation

Attitudes toward open access

- Attitudes among scientists toward OA are generally positive
- Medical researchers 91%; Information scientists 90%

Motives to publish in Golden Road OA journals:

- Expectation of higher citation rates
- Higher speed of publication

Main obstacles to publish in G R OA journals:

- Lack of familiarity
- Perceived lower quality
- No willingness to pay author or page charges

Attitudes toward open access

Motives to publish in Green Road OA

- Authors generally have little knowledge about legal conditions of self-archiving
- In 2000/2001 archiving was primarily done in mathematics, physics and engineering
- 2/3 favor OA post-print

General

- Humanities and social sciences are more reluctant toward OA than natural and life sciences and engineering
- Author and reader perspectives differ: for authors access is not as important as it is for scientists as readers

Attitudes toward open access

Reasons for differences between disciplines ?

- Degree of integration of a field, i.e. cumulativeness of knowledge production vs. fragmentation
- Different types of relation between author and publisher in connection with dominant type of publication – monograph vs. Journal article
- General differences between disciplinary cultures

Developments in copyright

- **Judge Rejects Google's Deal to Digitize Books**

[MIGUEL HELFT](#)

- [Google](#)'s ambition to create the world's largest digital library and bookstore has run into the reality of a 300-year-old legal concept: copyright.

http://www.nytimes.com/2011/03/23/technology/23google.html?_r=0&pagewanted=print Nov.16, 2013

- **Court Upholds Legality of Google Books:
Tremendous Victory for Fair Use and the Public
Interest**

<https://www.eff.org/deeplinks/2013/11/court-upholds-legality-google-books-tremendous-victory-fair-use-and-public>

Nov.16, 2013

- “The court made short shrift of the Authors Guild’s arguments on each of the four statutory fair use factors (the purpose of the use, the nature of the original work, the amount used, and the existence of market harm)” (ibid.)

Scientists' protest against evaluative use of bibliometric data

San Francisco Declaration on Research Assessment

May 13, 2013

- The motivation is the consensus that impact factors for many (cell biology) journals “do not accurately reflect the value to the cell biology community of the work published in these journals; this also extends to other fields in the biological sciences” . http://en.wikipedia.org/wiki/San_Francisco_Declaration_on_Research_Assessment Nov. 16,

2013

Recommendations i.a.:

- Publishers: “Greatly reduce emphasis on the journal impact factor as a promotional tool...”
- Institutions: For the purposes of research assessment, consider the value and impact of all ..outputs .. in addition to research publications. . . . <http://am.ascb.org/dora/files/SFDeclarationFINAL.pdf>

Scientists' protest against evaluative use of bibliometric data

Int'l Mathematical Union: Mathematicians Organize Boycott of a Publisher THOMAS LIN

- “More than [5,700 researchers have joined a boycott](#) of Elsevier ...in a growing furor over open access to the fruits of scientific research.

<http://www.nytimes.com/2012/02/13/science/mathematicians-organize-boycott-of-elsevier.html>. Nov. 16, 2013

Ted Odell (blog): **The Elsevier boycott one year on**

- “...surprised by how much progress of this kind there has already been, with the setting up of Forum of Mathematics, a major new open-access journal, and the recent announcement of the Episciences Project, a new platform for overlay journals. We are also pleased by the rapid progress made by the wider Open Access movement over the last year”.
- BUT: “Elsevier still has a stranglehold over many of our libraries as a result of Big Deals..” <http://gowers.wordpress.com/2013/01/28/the-elsevier-boycott-one-year-on/> Nov. 16, 2013

Perspectives of the future

Deep Impact: Unintended consequences of journal rank [Björn Brembs](#), Katherine Button [Marcus Munafò](#)

- “...we suggest that abandoning journals altogether, in favor of a library - based scholarly communication system, will ultimately be necessary. This new system will use modern information technology to vastly improve the filter, sort and discovery functions

of the current journal system.” <http://arxiv.org/ftp/arxiv/papers/1301/1301.3748.pdf> Nov16 2013

Perspectives of the future

Harvard University: Faculty Advisory Council Memorandum on Journal Pricing

<http://isites.harvard.edu/icb/icb.do?keyword=k77982&tabgroupid=icb.tabgroup143448> Nov. 16, 2013

1. Make sure that all of your own papers are accessible by submitting them to DASH in accordance with the faculty-initiated open-access policies (F).
2. Consider submitting articles to open-access journals, or to ones that have reasonable, sustainable subscription costs; move prestige to open access (F).
3. If on the editorial board of a journal involved, determine if it can be published as open access material, or independently from publishers that practice pricing described above. If not, consider resigning (F).
- ...
7. Sign contracts that unbundle subscriptions and concentrate on higher-use journals (L).
8. Move journals to a sustainable pay per use system, (L).

Perspectives of the future

- The combining forces of the publishers' oligopoly owned by hedge funds and governments' desire to control scientists' performance on the basis of (bibliometric) indicators will not be broken unless resistance on the part of the scientific community becomes more unified
- Unified resistance is not likely to emerge because the solutions for the communication system (open access) are not sufficiently diversified, i.e. do not respond to the different needs of different disciplinary cultures
- These needs have to be articulated by the scientists themselves – and they are subject to change

- The future of scholarly communication will be multifaceted. It does not seem likely that the different disciplinary cultures will be compatible and converge in a peer-reviewed-journal-article-bases-open-access-publishing model.
disciplines may take different pathways, e.g.:
- Depending on the availability of institutional funding and funds for article processing charges the transfer towards golden open access will keep up in disciplines with a culture focused on journal publishing. This transformation is consistent with the interests of large STM-publisher as well as with the requirements of the disciplines in question. Speed and reach of the transformation will depend on the volume of available funds. Problems will arise in cases where journals are owned by publishers that have not developed / are unable to develop Gold OA-Models.
- In disciplines with a publication culture that includes monographs and anthologies published by small publishers it is less likely that digital publishing will spread fast. Printed books will remain being important and the transformation will depend on (a) the development of sustainable financial models and the (b) acceptance of digital monographs and anthologies.
- In cases of disciplines that are highly competitive speed of publication is critical. Under those conditions journal publications become a less and less suitable means for the function to record priority. Those conditions favor the transformation towards Green OA.