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Academic Journals in Open Science: A Functional Approach

Presentation by Joachim Schöpfel, 22 November 2021

Thank you, and thank you to the organisers for the invitation. So, let me start to say something about myself. Thank you – I understand why this approach – you pronounced my name like a Dutch. You could pronounce it – it's not a Dutch name, it's a German name [laughs]. I am German and working now for more than 30 years in France. I'm not from the information side, I'm a psychologist. My first scientific career in Germany was as a psychologist at the University of Hamburg and then I moved to France, for quite personal reasons, and started to work in the public information industry, where I finished more than 10 years ago as director of a large library.

So now I am back to university but still with these two experiences and two different approaches, the one as a psychologist and with very clear ideas about the human factor and the functionality of what we are doing. I'm not really interested in technology but in function, and in humans using technology. And on the other side, the experience as information professionals in the CNRS and developing and managing large services and large systems. So, this – what I present – is quite different from what I normally do. Normally I'm interested in empirical research and scientometrics, surveys and so on, but here, what I present is a result of discussions with publishers, discussions with colleagues, reading papers on academic publishing and also, as you said, I'm working with the team from our own academic journal and doing work for others, and so on.

So, you can hear, and you know this in one way or another, since many years now, I think at least 20 years now, from the beginning of the web and the beginning of open access, that journals will disappear. So, one of the people I appreciate a lot is a scientist in life science – he's not from information science – Björn Brembs, professor at Regensburg in Germany, and he says since many years now something like, "the journal system is completely broken and destructive", "it should disappear". There are three failures: reliability, affordability, functionality. He describes the system as completely unfunctional and he says – just a couple of days ago, on the web – "we can now switch at any time" and "it can work without slaughter."

You know this, all people interested in journals know, that there are several reasons for criticism and scepticism. There are weaknesses, like the lack of reliability, the problem with selection, peer review, replication crisis. You all know this. Then there was, there still is, a journal crisis because of subscription prices: too expensive, too slow, with limited dissemination, and now, in a kind of way we switch to something we could call "article crisis", because now we have access to all but there are people who can't pay to be published. With other problems: predatory publishing and yes, open divide.

Open divide: the rich continue to publish like before, they are paying now to be published, and the others... OK. Little bit, as you said, with translation, some people can pay the translation, and the others... that's it.

And then there are other aspects, external aspects, not directly related to the journals themselves, like open repositories, preprint servers, and development of mega-journals which are kind of big databases. And then the question we'll see: that data may supersede journals. This is something we can hear since, I think, the concept of the fourth paradigm, that science will now be data science and no longer need for hypotheses, testing, no longer need for results, and so we have data, we exploit data, we don't need any publishing.

So, the point of departure for this discussion with colleagues and observations, was that yes OK, people said journals will disappear, other say that journals should – must – disappear, and yet, for the moment, there is nothing like a kind of mass extinction of academic journals. Just on the contrary, there are more and more journals, more and more journals in open access, more and more journals in the databases and more and more articles, but especially, you are speaking about journals, there are more and more journals, and the prognostic is: still increasing. I remember we had, fifty years ago, there was a committee in Paris and we spoke about a number of journals, there were people, very intelligent professors, I remember, said, oh there are too much journals, too much, we should put a capping, stop creating journals. But this is unrealistic; since then, the figure is still increasing, and will continue to increase it seems.

So this is where the question first arises: why? Why? You can make correlation with the number of scientists, you can make correlation with the number and investment in research and development, and there is a correlation, this is obvious. But why [does] this specific channel of scientific communication continue to be there? It must be useful for something, for somebody. But there are historical functions for more than 300 years now and there may be new functions. And this was the point. The new functions.

You spoke about sociology so you will appreciate, I cite a German sociologist, not in German but in English. The functional approach of Nikolas Luhmann: "an activity is functional, if it serves the perpetuation of the complex structured unity of a system." There may be other reasons, not only functional reasons, for the development of journals. I think one reason is the flexibility, diversity, and adaptability of the concept of journals. Technologically, [as I have] spoken, but also regarding the business model. I'm not Darwinist regarding society but you know the citation so I place it here. I think there may be something, there is surely something like this, that is a model which is flexible, it

can adapt, we saw it with the quick change from the business model from subscription to author payment, open access.

So, we have four traditional functions, which would have been defined many years ago, as to the "Oldenburg's shadow", and you remember the kind of historical, classical analysis of Jean-Claude Guédon who said, "we are still in the shadow of Oldenburg". Registration, certification, dissemination, archiving, the four traditional functions, are still there, and important. But for the moment I can't see any systematic analysis [of] what open science and the change of the environment of journal publishing will do or is already doing with these four functions.

Registration is still important but when you consider science as a common good, this is an aspect which is less important. Certification, quality control: OK, but when we move to open peer review, this function partly will weaken. And with predatory publishing anyway, certification is no... this is not certification. Dissemination is still there. Journals contribute massively to dissemination of scientific results but there are new and other channels outside of journal publishing. And then archiving: OK, but we know that there are problems with some open access journals which disappear, and disappear definitely, without any preservation anywhere. So the question: will open science subvert – I don't like the term, the word subvert – but, how will open science change this? I think we need some analysis.

So what I present here, the new functions, we discussed and we thought relevant. It's based on our own practice but also on studies like we did for the Ministry, when we conducted studies on the business models and economic health of journal platforms in France and in other countries. And so yes, doing this, the question was: why does this continue to function? And we found three, three functions, which may explain one part of the survival – more than survival, development – of journals. Political, economical and technological functions. They may explain one part of the resilience of academic journal publishing, resilience defined as "the ability of a system to withstand changes in its environment and still function".

So, political function: academic journals play a significant role within the functioning of evaluation and monitoring systems. When you analyse the Shanghai Ranking or the Times Higher Education Ranking, a large part, a significant part of this ranking – you know all what this ranking means for us, for our university, also in France, but in many other countries – a significant part is conditioned by journal publishing. And when you look specifically in France what the Ministry wants to know about the ranking of France in the international competition, in the international performance, scientific performance, where do they look? They look on the sector of journal publishing, not of number of theses, not of number of books, but mainly journal publishing. And OK, so, there are new initiatives, and on the left side I just pasted, copied one of them, new initiatives, outside of impact factor and this kind of metrics: altmetrics, but when you make analysis of the altmetrics, you see that mainly they are based exactly on the same kind of foundation: journal publishing.

The second function which may explain the resilience of this part of publishing, is the economical function. This is something we all know, we appreciate, or not. That is not a

question here. But academic journals play a significant role within the economic functioning of publishers, aggregators, agencies, etc. Etc.? I'm a member of a university not mixed with CNRS, but only a university laboratory, and one part, we have a very small budget, but one part of our budget is produced by incoming subscription of our journal.

So, globally, journals represent near 40 % of the total global STM market value... It's going down a little bit last year because of the pandemic but the industry expects this part to go up again to regain pre-pandemic value in 2 years or so. I think this is one reason why journals are there. I copied up there one famous sentence from Max-Planck-Gesellschaft, when they explained why they are in favour of transformative agreements – transformation, not disruption – because “there is enough money already circulating in the global market”. I think our colleagues from the digital library for Max-Planck were quite right. They *underestimated*, even, the money circulating but because it's becoming more and more money which is now circulating in the global market, related, in relationship to journals, and still going up.

So, the third function we discussed and then we published, it's technology. I'm not sure that it's a good – for the others, I know – but this, I'm not sure that it's a good expression, technological function. Perhaps it's more “data function” or “big data function”. Academic journals play an increasing role within the functioning of data systems, in particular for the acquisition and exploitation of big data by the information industry. A couple of years ago, not in conferences, not in papers, but “off”, when you spoke with some big publishers, they said something like, “anyway, journals, we could give them away for nothing” because what we get within journals are the papers and then the usage data, this is what is interesting, not selling journals, what we want is the data from the authors with all affiliations, with all who is working with whom, who is interested in which, and then the usage data. There are a lot of data connected to journals, publishing journals and disseminating journals on platforms and so on. This is interesting.

The big data environment transforms journals into a complex information generation device or system with high exploitation and valorisation potential. Everything becomes data. So this has been described in different ways, as a “vertical integration” by Posada and Chen and then other colleagues, as a kind of “data capitalism” by my friend Ulrich Herb, from Saarland, or by the STM publishers as “an eco-system that is continually in flux, containing a wealth of new trends and possibilities”, and then I added something we knew, and we know, that “if it's free, you are the product”. It's the logic of Facebook, of Twitter, Instagram and so on.

So this is the example of vertical integration, I will not explain, it's just a reminder. I'm sure many of you already had a look on this, even many times, it's quite different from what academic publishing, not *should* be, but has been. This is what the STM association of academic publishers published a couple of months ago, that are the trends for the next four or five years, and with the wording “let's go upstream”, which means to the source of research, data production and so on.

I would like to add something which I will not analyse further on here but I am sure we'll do it with colleagues in the future. You know all these elements: data, documents and so on, are transformed today in new information vectors if you want. Research, scientific knowledge graphs. And when you go through the elements of the knowledge graphs you will see that journal publishing, articles and data related to these journals are

one major part – and I think this is another reason why this function will contribute to the further development of journals. Journals produce structured data, controlled data, and then are related to, generate other data, as I said, the usage and so on.

So, and I will stop there. If it's really a sector which is endangered, vulnerable or threatened... in terms of biodiversity, are journals at risk of extinction? And perhaps the question should not be in this way, but which species are at highest risk? And I remember that there was a risk assessment when Plan S was published. Especially I remember, a very interesting study, an audit, in the UK, a risk assessment of the impact of Plan S for learned society. For instance, the French monitoring committee, I can't translate it correctly, it's a *comité pour le suivi de l'édition scientifique* [committee for the monitoring of scientific publishing], a high-level committee, I think they're going in the same direction. They're interested in which kind of journals may be more exposed to the risk of – perhaps not extinction, but going out of business others. But I think that these three functions I presented here, these are new functions, nothing to do with Oldenburg's shadow, but these new functions I think explain for one part why journals are still there and I think will be there a couple of years from now on. So, thank you.