OPINION
RULES OF THE GAME

BLOCKCHAIN AND DIGITAL IDENTITY: THE ANATOMY OF A SCIENTIFIC TREND

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Blockchain is not a technological illusion. It constitutes an authentic innovation in the field of distributed systems, introducing robust mechanisms for consensus, traceability and auditability without a single central authority. To reduce blockchain to a mere trend would therefore be an analytical error. However, the rapid expansion of this technology into the fields of digital identity and law gave rise, between 2016 and 2021, to a distinct phenomenon: a scientific trend. This period is characterised by a rapid surge in academic output, a high degree of discursive homogeneity, and a partial disconnect between the volume of publications and the production of cumulative knowledge. Consequently, the issue is not to dismiss the blockchain, but to understand how a real technology can, under certain conditions, become a scientific trend producing more discourse than established scientific results.

Furthermore, this case raises a broader question: how can we distinguish, in contemporary research, between sustainable scientific improvement and periods of discursive overproduction associated with emerging technologies?

A. BLOCKCHAIN: A SCIENTIFIC MOMENT

The study of scientific and proto-scientific trends (emerging fields of research) constitutes a major methodological challenge for understanding contemporary knowledge production, particularly in technology-intensive fields. Far from being a marginal phenomena, these trends structure research agendas, direct funding flows, shape conceptual frameworks and produce lasting effects on public policy. The methodological weakness of scientific and proto-scientific trends is a central issue. These phenomena occupy an intermediate position between established science and forward-looking discourse. They employ scientific forms and codes of scientificity

(publications, overt interdisciplinarity, legal and philosophical references) without always meeting the requirements of formalisation, empirical validation or cumulativeness. Their success rests less on the robustness of their results than on their ability to crystallise social and institutional expectations around emerging technical objects[1] . Studying these dynamics is essential because they produce a bibliometric inflation that obscures the true assessment of scientific advances. Furthermore, because they shift the criteria for academic recognition towards narrative conformity and alignment with dominant narratives. Finally, because they leave lasting effects, ranging from imprecise concepts and persistent normative promises to fragile analytical frameworks.

The field combining blockchains, law and digital identity is a typical example of this type of dynamic, with numerous interdisciplinary publications[2] . Between 2016 and 2021, it exhibited all the hallmarks of a scientific fad: an explosion of publications, lexical convergence around poorly established concepts, a strong presence of predominantly normative interdisciplinary discourse, and an explicit promise of a technological overhaul of the social contract. This enthusiasm attests to the emergence of a new field of research, at least in appearance. Critical and bibliometric analysis shows, however, that this moment of visibility corresponds to a phase of low scientific added value, which rapidly declined in terms of contribution from 2022 onwards, whilst substantive advances on algorithmic identity developed on the fringes of this media exposure.

Analysis of the literature on blockchain and digital identity reveals a dynamic typical of a trend fad. Combined searches on Scopus and Web of Science Core Collection show limited growth between 2010 and 2015, followed by a rapid surge between 2016 and 2019. On Scopus, the number of annual publications rose from around 130 in 2015 to over 750 in 2019, with a

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[1] Chen, C. (2006), CiteSpace II: Detecting and visualising emerging trends and transient patterns in scientific literature. J. Am. Soc. Inf. Sci., 57: 359–377. https://doi.org/10.1002/asi.20317

Nhu Khoa Nguyen. Emerging Trend Detection in News Articles. Document and Text Processing. University of La Rochelle, 2023. English. ⟨NNT: 2023LAROS003⟩. ⟨tel-04129421v2⟩ https://theses.hal.science/tel-04129421

[2] Buccafurri, F., Lax, G., Russo, A., Zunino, G. (2018). Integrating Digital Identity and Blockchain. In: Panetto, H., Debruyne, C., Proper, H., Ardagna, C., Roman, D., Meersman, R. (eds) On the Move to Meaningful Internet Systems. OTM 2018 Conferences. OTM 2018. Lecture Notes in Computer Science, vol 11229. Springer, Cham. https://doi.org/10.1007/978-3-030-02610-3_32

Careja, A., & Tapus, N. (2023). Digital identity using blockchain technology. Procedia Computer Science, 221, 1074–1082. https://doi.org/10.1016/j.procs.2023.08.090

comparable peak observed in Web of Science between 2019 and 2020. This surge is closely correlated with media coverage of public blockchains and the emergence of the Web3 narrative. It is also accompanied by a shift in the disciplinary focus. Articles with a predominantly legal, philosophical or socio-political focus have become the majority, whilst technical contributions account for a decreasing share of the total volume. Meta-analyses published from 2019 onwards show that over 60% of publications consist of conceptual or prospective work, without implementation or experimental validation. Furthermore, the few implementations that do exist also have limitations in terms of their operational quality and security[3] .

Discursive redundancy is a prominent feature of this corpus. Analyses of semantic similarity reveal a high degree of lexical homogeneity around concepts such as individual sovereignty, decentralisation and programmable fundamental rights. These concepts are rarely defined in operational terms. The result is a vast body of literature that offers little cumulative insight. The distribution of citations confirms this assessment, with around 5 to 6% of publications accounting for more than 50% of cumulative citations. This core corresponds to specific technical works, rather than to the dominant discourse. From 2021 onwards, the trend reverses. The 'trend phase' clearly emerges as a transitional period, rich in discourse but poor in cumulative results. From 2022 onwards, the most cited literature breaks with the central assumptions of the trend phase. The vocabulary of self-sovereignty gradually disappears in favour of formal analyses. So-called decentralised systems are in reality based on residual authorities and hybrid mechanisms. Blockchains play only a peripheral role.

Legally speaking, the promises associated with a blockchain-based digital identity clash with existing frameworks. Systems struggle to meet the requirements of accountability, challengeability and data protection. The notion of 'programmable' fundamental rights thus appears as a political metaphor. Real advances are emerging on the fringes of this cycle. They are based on a reclassification of digital identity as an algorithmic function. Systems manipulate conditional capacities for action rather than a stable identity. Finally, recent work is converging towards an understanding of

[3] Koteska, B., Karafiloski, E., Mishev, A., & University SS. Cyril and Methodius, Faculty of Computer Science and Engineering, Skopje, Macedonia. (2017). Blockchain Implementation Quality Challenges: A Literature review. Proceedings of the SQAMIA 2017: 6th Workshop of Software Quality, Analysis, Monitoring, Improvement, and Applications, 8:2. https://ceur-ws.org/Vol-1938/paper-kot.pdf

identity as a regulatory instrument. This perspective breaks with the idealism of the current trend and refocuses the debate on effective decision-making mechanisms. In truth, this scientific craze for blockchain is a classic case of a trend being taken up by related scientific disciplines at the expense of quality. This trend illustrates a broader dynamic: the rapid appropriation of a technical object by related disciplines, often at the expense of methodological rigour.

This phenomenon reflects a shift in the criteria for scientific legitimacy towards adherence to a dominant narrative rather than the production of robust knowledge.

B. THE ISSUE OF THE COMMERCIALISATION OF SCIENTIFIC PUBLICATIONS

The points made above raise a broader question: how should we judge the standard and quality of a scientific publication?

Indeed, we are seeing a shift in editorial practices, often at the expense of scientific quality. The number of journals and conferences continues to grow. Some offer the possibility of publishing low-quality results in return for payment, often without rigorous verification. In such cases, the scientific value is low or even non-existent. There are indicators for evaluating publications, such as the acceptance rate (sometimes ranging from 10 to 33 per cent in the most selective cases) or the average number of citations. However, these indicators remain imperfect and do not provide a reliable indication of the scientific quality being measured.

Another factor relates to the transformation of academic incentives. The pressure to publish, often summed up by the phrase *'publish or* perish', favours strategies of rapid production at the expense of work that is more methodologically rigorous. In this context, quantity tends to become an implicit indicator of performance, which may encourage the fragmentation of results or the use of analytical frameworks that are still not well established[4] . In this regard, the acceleration of publication timelines risks reducing the time devoted to peer review. Although this process remains fundamental to scientific validation, it is sometimes undermined by the

[4] Elbanna, S. & Child, J. (2023) From 'publish or perish' to 'publish for purpose'. European Management Review, 20(4), 614–618. https://doi.org/10.1111/emre.12618

increase in the number of submissions and the availability of reviewers. This leads to greater heterogeneity in evaluation standards depending on whether the context is journals or conferences.

Finally, digital visibility is playing an increasingly significant role. Dissemination platforms and alternative metrics (downloads, citations or shares) help to reshape the forms of scientific recognition. Whilst these tools contribute to a wider circulation of knowledge, this can have the effect of raising the profile of work aligned with mainstream trends, to the detriment of more technical or critical research. Finally, the increasing specialisation or interdisciplinarity of research fields complicates the assessment of scientific quality[5] . This means that work situated at the interface of several disciplines falls outside traditional evaluation criteria, thereby opening up space for both innovation and more fragile contributions. This highlights the need to adapt evaluation frameworks to the subjects of today's research.

To date, no solution fully addresses these challenges. However, the analysis offers several avenues for improvement.

- Firstly, by strengthening requirements for empirical and technical validation, to better distinguish robust contributions from more speculative work.
- It is also a question of placing greater value on more in-depth research, the results of which, because they often require longer production times, call for modes of development and publication that operate within timeframes different from those imposed by the contemporary demand for speed.
- Secondly, the development of more refined bibliometric methods is necessary[6] . This allows for the simultaneous integration of the volume of scientific output and the quality of the work into their actual impact at the theoretical, methodological or operational level. Greater selectivity on the part of journals and conferences may,

[5] Thelwall M, Kousha K, Stuart E, Makita M, Abdoli M, Wilson P, Levitt JM (2023), "Does the perceived quality of interdisciplinary research vary between fields?". Journal of Documentation, Vol. 79 No. 6 pp. 1514–1531, https://doi.org/10.1108/JD-01-2023-0012

[6] Ninkov, A., Frank, J.R. & Maggio, L.A. Bibliometrics: Methods for studying academic publishing. Perspect Med Educ 11, 173–176 (2022). https://doi.org/10.1007/s40037-021-00695-4

Paul J, Lim WM, O'Cass A, Hao AW, Bresciani S. Scientific procedures and rationales for systematic literature reviews (SPAR-4-SLR). Int J Consum Stud. 2021;45:O1–O16. https://doi.org/10.1111/ijcs.12695

conversely, help to maintain high standards and avoid the rising flood of publications, within a framework aimed at establishing a merit-based economy at the heart of scientific endeavour.

More broadly, these developments represent a collective challenge that the scientific community should address to prevent the credibility and quality of research from being undermined in a context where the proliferation of publications is driven by increasingly pressing demands for visibility, facilitated by the use of artificial intelligence[7] .

[7] Kousha, K. and Thelwall, M. (2024), Artificial intelligence to support publishing and peer review: A summary and review. Learned Publishing, 37: 4–12. https://doi.org/10.1002/leap.1570