INTEGRATED FUTURE(S)

THE INFRASTRUCTURE OF SCIENCE
Open Science and the future digital architecture of science

Welcome to Integrated Future(s), IF.

IF is a weekly newsletter about the future of emerging technology and the impact on science, medicine and society. This tech will include artificial intelligence, blockchain, quantum and neuromorphic computing, robotics, nanotech, neurotech and more; along with other things not yet identified.

We will be looking at how they will integrate with each other and with the technological infrastructure of science in our society, also known as technoscience.

This week we'll explore some peer-reviewed literature reviews on the topic of blockchain and health/research, along with the importance and value of peer-review in science.

We'll also look a little more closely at Open Science along with the history and future of technoscience. It will serve as a foundation for future discussion and integration between legacy and novel systems.

Please remember that the map is not the territory.

- Sean

PEER REVIEW IN SERVICE OF OPEN SCIENCE

https://blogs.plos.org/plos/2020/01/peer-review-in-service-of-open-science/

Open Science is a term that relates to a framework for the open access of science to all inquiring minds. It is also a movement to (re)establish this as the norm, particularly for publicly funded research. Open Science has a number of aspects (open data, open samples, open access publications, etc.) and schools of thought on the extent of application and route to get there. The Wiki page is a decent comprehensive place to start if you are unfamiliar. This article from Public Library of Science (PLoS) is a timely look at Open Science from one of the primary vehicles for open access publishing. The concept and costs and benefits to application of Open Science are critical for exploring the application and impact of emerging technologies on science and society. You should be familiar with this in the future.

THE WEIGHT OF PEER-REVIEW

Peer-review – the review, critique, and feedback of scientific work as refinement and gatekeeper to published literature – has been a staple of the scientific system for hundreds of years. It is often criticized but has never been matched at scale as an enterprise wide quality assurance system. Current estimates are that 64,000,000 million volunteer hours each year go into the process across all science publishing. That's roughly equivalent to a full-time staff of Salesforce. Given that most of it is done by those with advanced degrees and/or significant experience, it is worth roughly $3 billion a year to the industry. Yet to pay for the activity may risk degrading the value of the trust it represents. We'll revisit this.

BLOCKCHAIN TECHNOLOGY IN HEALTHCARE: A SYSTEMATIC REVIEW

https://www.ncbi.nlm.nih.gov/pubmed/30987333

Agbo CC, Mahmoud QH, Eklund JM; Healthcare (Basel). 2019 Apr 4;7(2)

BLOCKCHAIN IN HEALTHCARE AND HEALTH SCIENCES-A SCOPING REVIEW

https://www.ncbi.nlm.nih.gov/pubmed/31865055

Hasselgren A, Kralevska K, Gligoroski D, Pedersen SA, Faxvaag A; Int J Med Inform. 2020 Feb; 134:104040

APPLICATIONS OF BLOCKCHAIN TECHNOLOGY FOR DATA-SHARING IN ONCOLOGY: RESULTS FROM A SYSTEMATIC LITERATURE REVIEW

https://www.ncbi.nlm.nih.gov/pubmed/31794967

Dubovitskaya A, Novotny P, Xu Z, Wang F; Oncology. 2019 Dec 3:1-9

Why bother with publishing in a legitimate peer-reviewed journal? Here are three reviews on the topic of blockchain and health from the past year, two general and one subtopic specific. What's missing? Everything that wasn't published in a journal indexed in the known literature search engines they used. If you aren't publishing in the peer-reviewed lit, you aren't getting noticed or validating what you are doing. I'd estimate that less than 5% of notable projects are being captured. It took a scientist only a few days to realize Theranos was a scam. No published lit.

PROBING TECHNOSCIENCE

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3234348/

Karen Kastenhofer and Astrid Schwarz; Poiesis Prax. 2011 Dec; 8(2-3): 61–65

Technoscience is a term born from philosophy in the 1980s. Originally a focus on the intersection of science and technology there is a second main branch that focuses on the impact of sci/tech on humanity. This article is a comprehensive look at the topic. Initially I'll be mainly focused on the intersection with the impact to follow later.

That's it for this week. We'll continue the conversation next week including diving into quantum and neuromorphic computing and looking at how they integrate with other emerging tech and fit into the framework of the future of science. Share as you like. Questions and comments to seanmanion@sciencedistributed.com. Thanks for reading.

Sean T Manion PhD is a neuroscientist, former federal research admin and bureauscientist, and technoscientist with a focus on blockchain and other emerging tech. He is a Chief Editor at Frontiers' Blockchain for Science, a Fellow of the British Blockchain Association and co-author of the book Blockchain for Medical Research: Accelerating Trust in Healthcare with Yaël Bizouati-Kennedy (CRC Press, April 2020). He is currently performing the duties of self-appointed strategic planner for science.

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