Review of: "Infodynamics, a Review"

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The author provides a thorough review of Infodynamics and makes a decent attempt at herding a vast array of concepts into a coherent article, but runs into a number of issues that give rise to some contradiction and confusion.

In his description of information, he states that it is**'an abstract concept with divergent meanings. No precise quantifiable definition of information can be applied to all realms where the concept is used.'** This statement recognises the enormous challenge faced by those aiming to intuit any sense of scope relating to the subject of Infodynamics and presents us with one of two possible scenarios: Either…

- A) The statement is accurate and suggests that we cannot say with any clarity what information is or is not. In which case, what hope might we have of developing a field of scientific study with any degree of confidence, and to what end?
- Or B) The statement is inaccurate.

As it's so early on in the article, my suggestion here would be to offer something that acknowledges how tricky and opaque the subject appears to be, but that also encourages the reader to continue reading by offering a little more hope of getting somewhere with it by the end of the article. This may be helped by offering more of a sense of what the article aims to achieve.

He also states that (information) **'is not in itself a physical reality although it requires a physical substrate in order to become a reality'.** This is a little contradictory and may be helped by some clarification over what he means by the term 'reality' and what process facilitates the transformation.

I feel that the lack of clarity over a workable definition undermines many of the points made in the rest of the article, particularly when referencing the relationship between energy and information and how they are '**parts of two separate realms of reality that are intimately entangled that follow different laws of nature'.** I would argue that there cannot be different laws of nature, only different lenses through which we observe different aspects of nature. Surely the task is to find a lens through which we can observe a singular realm where energy, matter, and information are all law-abiding citizens.

If we consider matter and information only exist in the context of ephemeral configurations of 'packets' of energy during processes that arise from interaction, it is possible to observe precise correspondence in the way that such processes configure both matter and information into systems.

- Systems interact, transacting energy or matter, causing perturbations (Signals)

- Perturbations give rise to spatiotemporal oscillations or work (signal sequences)
- The work transduces energy & matter into new products and by-products (sets of sequences)
- The products and by-products are distributed (schemas of sets)
- Products and by-products are integrated into the system or expressed, catalysing internal / environmental change (systems of schemas)

Expanding on Lotka's maximum power principle, Odum (1995) states that 'Self-organising systems that prevail tend to be those that maximize the intake, optimise the transformation, and reinforce the production and efficiency of energy'. It follows then that an ability to transform entropy (that which would otherwise be unavailable as free energy) into a usable resource might not only be beneficial, but perhaps one of the most important, fundamental principles of survival and, in a broader sense, evolution by natural selection.

All organisms must act strategically in order to survive, which necessitates some form of ability to detect signals of differing perturbations, interpret differing signal sequences as having different meanings, discern differing sets of sequences and corresponding action responses, organise sets into differing schemas to prioritise actions, and consolidate schemas into differing systems that facilitate appropriate 'if-then' action responses. It's this capacity that then enables abstraction and, thus, intelligence.

In this context, one could say that while data and entropy might equate to the same thing, information only becomes such when signals are transduced, configured, and inferred, which makes me question the use of terms such as 'useful information' and 'noise', which are surely subjective and, as such, not empirically quantifiable as suggested.

If we think of systems as flow networks, we observe that information is merely one of the many efficient flows of resources, money, services, and so on that complex systems depend on for fitness but do not offer free energy. It is worth noting that all of them are derivatives of and analogous to energy flows in terms of how they are processed.

Should any of these observations prove to be helpful and / or of interest, I offer deeper insight in my recent paper.

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