Twitter Thread by Carlos E. Perez

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This is an insightful article about what's wrong with Google as compared to Amazon, Microsoft, Apple and Facebook.

Which actually reminds me of the difference between organic and engineered designs: https://t.co/JMmSyBvA0J

Organic or biological designs are reusable designs from the ground up. They accommodate the needs of the environment because of the generality of the architecture. They don't pretend to solve just a narrow problem.

Architectures like biology that lead to general intelligence (i.e. like you) are from the ground up built from reusable components that encourage combinatorial mixing opportunities. One can never correctly guess the needs of the environment (i.e. market).

The opposite of generalization is pre-mature optimization. A company that has is genesis as a one-product company has a bias toward optimizing the entire stack. As a consequence, it compromises reusability and thus shuts of future opportunities of evolution.

The opposable thumb is shared by a common ancestor of the great apes and humans. However, apes have optimized for strength and not dexterity. As a consequence, lost this capability and thus further shut themselves off to an evolution path of higher intelligence.

The human jaw is weaker than apes because humans lost an important gene. However, the consequence of a weaker jaw was a jaw that was more flexible. Thus leading eventually to a richness in vocalization.

A key architectural feature for survival in the biological world is the reusability of the underlying components. All biological life shares the same nucleotides (4) and proteins (21). Evolution has somehow consolidated its design into a reduced instruction set (RISC) computer.

A second architectural feature is that biology is continuously testing its components. The above article points to the practice of eating your own dog food. One cannot achieve reusable components if these components are not subject to demanding environmental demands.

What persists in biology are those components that prove to be ubiquitously useful. Those that do not have an evolutionary path that is fragile and can at any time be replaced by a more useful alternative. Biology is continuously error-correcting for reusability.

Darwin's Theory of Evolution is commonly understood as a natural selection for environmental fitness. That is the goal of the species is to survive. However, this interpretation glosses over the fact that survival exists at a multitude of scales.

There is a constant competition of what gets propagated by a species DNA. An organism is engulfed by a multitude of bacteria and viruses that are also propagated to a species offspring. Parts of an organism are in a constant battle against alternative parts from its environment.

Humans lost the ability to produce vitamin C because of the abundance of fruits in the environments of human ancestors. The body does not have to create things that might be readily available in the environment.

Evolution thus is not a constant struggle for survival as a reading of Darwin may have implied. Rather, it is a constant struggle for usefulness. Every part of biology must justify its existence by revealing its usefulness.

Evolution is a story not of fitness, but rather of relevance.

Humanity is a story not of human survival but rather a story of human relevance to the universe.

Relevance is enabled by what David Deutsch @DavidDeutschOxf described as reach. The reach that is available to computation, biology, language and human explanatory capabilities is driven by the universality of it underlying components.

Reach is enabled by the interplay of first principles of modularity.
https://t.co/degRiNt0Oc

The openendedness of the universe, that fact that future has yet to be invented requires a mechanism to invent the unknown. This is a generative model that reformulates what is available from knowledge of the past, to invent an entirely novel future. https://t.co/ilLBULLJEO

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