Surviving Speed and Complexity
By Michael W. Wright

Our principles of business operation and design, derived from our selective knowledge of history, are being extrapolated and adapted to the future, and as such, will struggle for relevance in the new contexts reshaping our thinking.

We might believe that our vision of reality is based on a linear story linked directly from the environment to our mind. Yet, we know from evolutionary psychologists that human behaviors reflect the influence of millions of years of physical and psychological predispositions that make it extremely difficult to understand that our vision of reality is framed by nonlinear equations. The link is not just between the environment and the mind, but between the mind and the mind.

Forty years ago, I saw a quote on a very successful business leader's wall that has never left me, it said "Each of us is developing a strategy for the world we *think* we live in". What then shapes how we think about the world? In an era that is changing at exponential speeds, a time when human activity has become complex, interdependent, interrelated, and interconnected, do our core primal constructs built on millions of years of evolution, enable, or disable our ability to think, learn and manage the world we have built?

While the debate in physics might remain about multiple universes, there is no doubt we all have multiple realities. We all have unique points of view shaped over time and experiences that help form our personal perspectives, but we also have a few unmodified set points, our DNA internal context as a species, that shapes how we see the world and limits our adaptation to it.

Our eyes track a moving object better than a stationary one over time…baseball versus golf, contrast versus similar, today versus the future. Why? Because we are still wired to be hunters. Technology has changed the external context of our being, but it has not changed the internal context upon which our DNA tells the brain how to protect and preserve us as individuals and as a species.

If we had successfully adapted to technological change, wouldn't our DNA also have changed and adapted our primal core to our activities? If that were the case, we wouldn't get jet lag and social media wouldn't be able to addict us. But we do and it does. And our linear, short term, biased mindsets show few signs, if any, of addressing either one.

In simple terms, since we all like simple, all behavior is contextual and context sets how we see the world, how we think about and subsequently behave in it. Today, context has taken on new dimensions neither anticipated nor envisioned by the great philosophers, thinkers, and leaders of the past whom we rely on for the values we

use as touchstones for behavioral context around the world. I once wrote "Performance is the residual of Behaviors", to guide business leaders where to focus their energy and get the most out of the people driven activity that is business. If we were to look at our performance as stewards of the planet, the impact of our inventions, and our treatment of fellow humans, even a passing observation suggests we need a closer look at the elements of our thinking that are affecting our behaviors. There are too many to cover in one article but what follows are two that stand out in our volume at velocity world.

Speed: Our Context Has Changed

"*The greatest shortcoming of the human race is our inability to understand the exponential (power law) function.* " Dr. Albert Barlett, Professor Emeritus, University of Colorado.

The head of MIT's media lab in 1996, Nicholas Negroponte, said it simpler "People don't get exponential". Yet here we are in a global technological transition taking place at exponential speeds, changing our external contexts and our behaviors yet resting on outdated, outmoded, and out of synch internal contexts that are primal, hard coded, and exist solely to 'win' our place in community, mate selection, and resource hierarchies.

According to Dr. Anna Lembke professor of psychiatry at Stanford University School of Medicine and chief of the Stanford Addiction Medicine Clinic, "connecting with people is a biological need that releases dopamine, the happiness addiction chemical of the brain." Our internal context systems networks have evolved over *millions of years* (our DNA modifies slowly on its own and not by the internet…yet) to get us to organize into communities, to find mates, and replicate our species.

To date, people do not understand the power of power laws- commonly referred to as exponential curves. The curves themselves fool us because of their inherit nature of little change over extended periods of time. As Hemmingway said in *The Sun Also Rises*: "Gradually, then suddenly", describes the path of the curves we are experiencing in every facet of life. Or as paraphrased from the book the Exponential Era, from which this essay is derived, perhaps it reflects the fact that power curves are simply too difficult a concept to grasp for our hardcoded brains that are based on circadian rhythms, function best with emotive images, and that prefer to think relationally and linearly. It could also be that because 'words are the skins of thoughts' our continued use of words and philosophical constructs from a slower paced, photosynthesis-based world, don't serve us well either.

Our continued use of photosynthesis words to describe business activities, like "seed" (as in seed money in the venture world), "plant" (as in initiate a foothold in a market), "cultivate" (business development of a new market), "harvest" (sell) and "cash cows" (usually revenue streams that are being "milked" for remaining profits

before the market collapses or is disrupted) or circadian rhythm terminology like 'give it a rest' or 'sleep on it' or has locked our thinking into a pattern of behaviors completely out of synch with our era. Today, we don't operate on circadian rhythms or agrarian time scales. We are 24/7/365 tuned into our screen 'machines'. Machines don't sleep, don't eat, and don't need community.

This is an era marked by the confluence of fast-changing technologies that converge to create new ecosystems, resulting in digital disruptions at a velocity and volume never experienced by humanity. It ignores our hard-wired primal core, leaving us slow to adapt to changes that are happening in new unchartered time scales. The technology growth that we are experiencing today does not follow linear progressions like animal migrations, growing seasons, or calculated production runs.

Societal advantage today is having access to data and having the ability to understand the information the data is telling us. Accessing, aggregating, analyzing, and acting on information faster than the competition is on every individual's and organization's critical path for survival. While surviving has always been about have and have not's, it is an era where "knowing" is becoming paramount to surviving. The traditional "have's and have not's," which referred to one's means and access, has accelerated, transformed, and become "those who know and those who don't". This is an era that runs on creating, harnessing, intercepting, and integrating technologies at speeds and scales (other than plagues) never experienced in human history. We are fundamentally changing how we determine the world we think we live in. And, contrary to what we would like to think, our DNA has neither adopted nor adapted or changed in relation to any of these rapidly changing externalities that defy circadian rhythms and photosynthesis constructs. However, our hard coded DNA *is* allowing our brains to re-wire neural pathways and our behaviors in response to these new external contexts. It also allows technology to do the re-wiring as well.

It's interesting to note that our brains have built in shortcuts to by-pass circuitry that can get in the way by slowing down our processing speed. We bypass complexity and respond quickly to stimuli deemed dangerous. These are things that can or are perceived to be capable of causing us hurt. Hurt builds stronger pathways to help us evaluate consequential decisions about the future. We learn more from hurt because our survival depends on learning from it. We follow and congregate with others of like mind in the process of building communities, which connect us and makes us happy, but also where rejection and physical pain use the same neural highspeed pathways. Pathways that technologists use algorithms to exploit our fear of rejection, of being outcast from the 'community' (aka tribe, family, base, followers, bros etc.) and shape the contexts forming our thinking, and with more and more frequency to successfully drive our behaviors.

These new technological algorithm-based systems have begun training us to be constantly engaged (dopamine dispensers), and shape, by default or intent, our

thoughts, feelings, values, belief systems and assumptions all of which are influencing our behaviors at speeds rendering the reference contexts of the past vulnerable and easily violated. We are overwhelmed not by information and tasks, but by distractions. We are preoccupied with input stimuli designed to keep us engaged and addicted to uncertainty (what comes next--e.g., scrolling, who likes what? Etc.) stimuli that make us happier…. for the moment. Addiction to a screen, based on our own internal biological context, is being exploited by new externalities shaping our realities and the world we think we live in. Truth truly does 'mutate before our eyes'.

In the time horizons in which ancient, and more recent philosophers, posited about the human condition things moved slowly. Today most pundits are technically ignorant and have no insight into the point of departure we are experiencing. Quantum computing, AI, NLP/NLU, ML, Computational Biology, Gene modification, alternative energy...etc. all are NASCENT on the human timeline. The past is truly not a prolog for the future anymore, if indeed it ever was. Fire becoming known to a few and spread over centuries, or more recently the adoption of robotics over decades is different than a new 'fire' learned by billions in an instant.

Our inability to relate to power curves is most pronounced when we try to grasp the fundamental construct of even simple exponential curves. Picturing in our minds how technologies move imperceptibly across what appears to the brain as distant and slowly approaching horizons - only to be surprised as they suddenly explode in front of us at speed and volume - is one of the great mental conundrums facing us today. These explosions in the growth and the unprecedented rates of adoption of new technologies are leaving most of us unprepared and in wonder. We find ourselves trying to set our minds to a view that is capable of constantly adapting to the sudden appearance of new technologies and digitally driven transformations.

These digital transformations are the direct result of the confluence of new technologies converging to create entirely new ecosystems. These new ecosystems grow at velocities well beyond our primal brain's hunting mode speeds by orders of magnitude. Calculating where to launch a spear and at what speed to intercept a target remains a difficult task that takes time and practice to master. However, a computer aims, calculates range, fires, and hits a target in milliseconds, again and again.

Humans have difficulty observing and responding to the future. We have trouble extrapolating meaning or even putting energy into understanding a time horizon that appears to be far away. While some of us can marshal and focus our brain's processing energy on "futures", most of us can't. In fact, very few of us can focus for extended periods on our future. The reason is fairly simple. Our brains are not comfortable with diverting energy from human self-preservation and survival. To survive, we are careful with how we allocate our finite brain energy - and it is very much "in the moment! "

Research shows that our brains think that concentrating on our current self is rather more important than worrying about our future self, let alone future generations. The study of fMRIs overwhelmingly concludes that the energy that our brains put to our current self, relegates the future self to a much lower priority. As Jane McGonigal, director of the Institute for the Future writes: "Your brain acts as if your future self is someone you don't know very well and, frankly, someone you don't care about." It seems only logical. After all, we have survived as a species for a long time by being alert to immediate threats. Our brain activity is largely occupied with operating life-preserving processes and looking for threats and pleasures right now. This leaves us wide open to dramatically underestimating the real and inescapably complex impact of the suddenness of exponential change.

Complexity: The Inescapable Context

"The growing complexity of our times makes certainty about any move or any position much more precarious. And in this networked world where information moves at the speed of light and 'truth' mutates before our eyes, certainty changes and speeds off at equivalent velocity."—Margaret Wheatley, in the essay "Willing to be Disturbed," from Kaos Pilot A-Z by Uffe Ubaek (Aarhus, Denmark: KaosCommunication, 2003)

Understanding the underlying complexity of power curves does not come easy to the impatient or the quick. One of the best stories that make the complexity accessible is from the history of the beginning of chess that comes from India. It involves a simple grain of rice as a starting point, (or in tech terms a single signal) and the 64 squares of the chess board. The emperor offered the inventor of chess a reward of his choosing, the inventor said, "*Give me one grain of rice for the first square of the chessboard, two grains for the next square, four for the next, eight for the next, and so on for all 64 squares, with each square having double the number of grains as the square before.*"

Without much thought, he granted the man his wishes. It wasn't until sometime later that his treasurer came back and advised the emperor that it would be impossible to pay the man the quantity requested, as the amount of rice added up to an exorbitant amount: 18 quintillion (18 followed by 18 zeroes) grains of rice to be exact, the equivalent of roughly today's entire worldwide crop for a decade.

How could the emperor be so easily deceived? Simple. He was thinking linearly like most of us often do, while the ingenious man understood and used the underlying complexity of the exponential curve to his advantage. And therein lies the threat, or the opportunity of complexity depending on your point of view.

Humans tend to think linearly, not in complex systems of networks, but the technology changes we are experiencing don't follow linear flows, they are a network of networks that rely on complex interactions, interdependencies, and interrelationships to function. These technology changes shape the contexts that

inform the way we think, see the world, and understand our realities but without our understanding of how or why they do because we cannot keep pace with the exponential growth of their complexities. Our new values reference points are obscured from our view and moving away from our control, how then can our questions be answered sufficiently to provide facts at speeds we can respond to? Especially when the machine can't answer questions about itself. A complex conundrum has emerged that challenges how we think because now we are losing sight of who is creating the thoughts we think, and soon forming even more of our experiences, and where and from what did they build their contexts?

Unfortunately, the complexity is amplified because we try to use linear relationships to create non-linear systems. We extend and extrapolate, we add derivatives and alterations, we allow the system to be fuzzy but, in the end, these are all mathematically defined relationships whose elements are weighted (biased by default…humans must choose the weighting, allow the machine to generate them based on a human built source, or provide a fixed range), and exercised. The effort is focused to eliminate chance and address the issue that decisions at volume and velocity means outcomes can be really big and really wrong. As Dr. Massoud Amin, father of the smart grid, wrote in the CIN/SI (EPRI) summary and speaking of the electrical grid "The common feature among all such critical infrastructure systems is the *level of complexity* in the large interactive networked systems whose behavior critically determines the level of confidence in such systems."

While we get better all the time at the analog to digital conversion, it is always within a well-defined context and limited data sets addressing specific instances. Yes, machines can diagnose skin cancers more accurately than technicians but that same machine cannot be used for anything else. The amount of data, the complexity of teaching the machine (machine learning ML), and the computing power to render an 'answer' don't transfer well.

Yet we like to think we can overcome the non-linear real world with linear equations. The complexity of our real-world systems shows us otherwise. As an example, like all human systems on the planet today, how we experience the behavior of the economy is through a series of complex interconnected, interdependent, and interrelated networks that can change instantly with volume at velocity. Small movements in seemingly disconnected, remote areas can ripple and amplify larger systems. E.g., a freighter caught in the Suez Canal, chip shortages in Taiwan or South Korea, the war in Ukraine impacting world food, etc.

Our rapidly and continuously evolving at exponential rates AI systems can write better stories, identify people and moods more accurately, create news that is indistinguishable from reality, but all we have done is pile on complexity and demands for more energy to contain and control it. Not just the electrical and physical energy but also the intellectual and emotional energy to sort fact from

fiction, to prevent the disappearance of questions, and slow the growth of the adoption of technologies that we have no idea about how they will ramify.

We are under a real time constraint to figure out how to think about our new contexts that are shaping how we are adapting to the world we think we live in. Trying to think we can deal with non-linear realities brought about by the convergence of technologies at speed and the creation of complexities beyond our reach, by continuing to use linear thinking and constructs from a slower time and human based point of view, borders on the absurd.

That time constraint is the rapid scaling of the challenges we face that are filled with complexities upon which the whole of civilization depends. How we deal with energy, water, food, shelter, healthcare, and the economy will depend on how we see each complex system and through whose eyes.

Denying the speed and complexity because it's hard for our DNA bound minds to grasp, is unfortunately our default mode. If we don't change our thinking by revisiting our contexts, by learning from history and figuring out how to calculate before we engage or act, the residual of our behaviors will be a catastrophic performance as we leave our historical guideposts behind.

In these, just two of many, new contexts of speed and complexity how we think about the growing gap between digital and analog realities has the potential to leave the 'common good' orphaned in a no man's land of our own making. While much of the digital space has been 'private' that too is changing with governments and bad actors taking on more control of the space very much like they have of our more traditional physical space. The difference is the former can exert greater power and influence over the later.

We remain tied in our governance processes to 19th century institutions whose processing speed and ability to deal with complexity are ill-suited to execute policies able to prevent their own atrophy. A 4-year political change is 2-3 generations of change on an exponential technology curve…e.g., 2, 4, 8, if you add multipliers like convergence and new levels of complexity, one might argue that we are on the verge institutions obsoleting themselves in general. If you've never heard of DAO's (Distributed Autonomous Organizations) that operate outside of regulations that are still being debated, well it's like watching ignorance accelerate as the institutions grapple with these new players. With DAO's we are relying on unknown and sometimes unknowable operators who may or may not be morally informed or concerned with the greater good.

Who then steps into the gap? If we truly believe that wealth exerts power and wealth in the 21st century stems from the capitalist system of businesses, what form of capitalism can survive our exponential era? And who will be the principled business leaders filling the void? If history can be relied upon to give us a framework capable

of helping business leaders adapt to rapidly evolving dynamic change, it must be one built upon the internal context of our species' DNA coded dependencies on community and shared values.

* The Exponential Era, Espindola & Wright, Wiley, 2021

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