THE DIGITAL ECONOMIST

Position Paper

The shock After The Shock

How the pandemic is shaping the human-centered digital economy

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February 24, 2021

For decades, digital technologies have been revolutionizing the way we live and work. But there's nothing like a crisis to cut to the core and show us exactly what developments look like. How robust are our digital processes? Have we sacrificed too much agility for efficiency? What will post-COVID humanity in a digital economy look like?

Introduction

At time of writing, the coronavirus pandemic and its variants continue to take lives, disrupt people's day-to-day routines and threaten the existence of entire industries. At the same time, having crippled society, COVID-19 has been leading an urgent executive charge of digital transformation for enterprises and economies.

Despite its unpreparedness and fragility, humankind shines in many spots. The Internet still runs. We remain glued to social, messaging and conference apps with at least one new drop-in voice app breaking through despite, and perhaps because of, the times. We shop essentials online, tune in to TV, stream entertainment and game e-sports to occupy us during lockdowns. These systems are not just entrenched in our normal lives and times. They are proof of infrastructural capability, scale and access from decades-long inventions to deliver on-demand contingency solutions with mostly as-is experience in the wake of a disruption like the pandemic. Instead of collapsing, the physical human world quickly switched over to its antifragile younger digital twin. While leaning on a digital economy where people could operate from home lockdowns, thousands on the physical frontline have delivered heroic tasks in a legacy economy.

With starkly opposite outcomes, the undesirable biological forces of destruction and desirable digital forces of construction arising from the pandemic both are centered around humankind. As we face the shock after the shock to digital enterprises and digital economies, we must consider a set of characteristics desirable for human-centered outcomes. Learning from humankind's track record, scale and experiences of creating global technology systems, we unpack the characteristics for a roadmap for a new digital economy system.

The Future of Work is Now

Three patterns and their associated characteristics are useful to understand the future human-centered digital economy.

The new digital economy must be built with a pattern and affinity for antifragility.

To reboot the post-pandemic new digital economy, we need systems that are always on, widely affordable, ubiquitously accessible and able to thrive in the wake of attacks and stressors. This is not new, as technology systems have been improved progressively in many ways: fault-tolerant systems with their ability to continue operations despite component faults, high-availability systems where attention is shifted to delivering an agreed upon level of service uptime, robust or resilient systems fundamentally designed to resist change, albeit allowing change for the good, leading up to modern antifragile systems which make up streaming media, social platforms, massively multiplayer online games and electronic commerce. This last category of modern platforms increases in capability during disorder – an antifragile phenomenon in technology called elastic scaling – and makes humankind's inventions shine in face of catastrophes.

A human-centered future digital economy follows the behavior and pattern of a self-organizing system of systems.

The human-centered digital economy shapes as a self-organizing and cohesive systemic whole. This whole continuously equilibrates from one cohesive state to another, arriving through order and disorder learned from self-organizing. A holistic system of systems shows part-whole relationships despite stress, disorder or chaos. It exhibits important behaviors and characteristics: Architecturally, individual components together behave as systems. Commercially, an affinity set of systems behaves as services and flow of value. And societally, these services and flows steward human-centered interactions and relationships to spawn a new era of social contracts. Notwithstanding the ebb and flow of political change and tug in trade relationships, the behavior of the self-organized whole optimizes for diagnostics and behaviors across parts and, similarly, across geographical borders in a digital economy. The more complex the system becomes, the greater the need for self-organizational capabilities.

A human-centered digital economy is built with incremental cost constructs and incubation hacks learned from a pattern of technology development.

A human-centered digital economy has cost characteristics conducive to iterative improvements. Capability, scale and antifragility in software-intensive systems derive from a mindset of getting it out versus getting it right. Many of the digital transport protocols underpinning the Internet were invented for a best effort delivery versus a guaranteed delivery intent. Similarly, good enough architecture, for systems like consumer electronics in which blueprints don't have to be perfect, minimum viable products, which bring out small functional proofs, iterative and agile practices that permit rapid cycles to accommodate for the reality of variability and change midstream,

are all methods and manifestations of a digital world and digital economy. When we don't allow perfection to get in the way of the possible, digital paradigms deliver a crescendo of innovation to institutions, economy and society. These "works in progress" are imperfect by nature, yet able to evolve and improve on an ongoing basis.

And, as we see, such systems continue to shine even in a pandemic crisis. The outcomes from this digital mindset are not just technology systems hosted in backend data centers located in specialized buildings. Increasingly, the outcomes are systems at the edge of computing, embedded into point-of-use by humankind. Examples include soil, weather, fertilizer intelligence in smart agriculture; material, environmental, and provenance measurements in smart supply chains. These produce high yields, ensure swift distribution, employ and schedule optimal workforces to keep us nourished, healthy, and productive. These are distinct from lean and just-in-time supply chains and other systems, which – as we have seen in the context of the current pandemic – have struggled in abnormal situations.

Already today, the cost characteristics of digital systems deliver largely uninterrupted experiences in over-the-air capabilities of vehicles, digital assistants, home and ambulatory healthcare in an economy and planet equipped to handle complex events. Digitalization is poised to turn the corner from the Internet of things to an economy of things. These outcomes and successes are enjoyed as a result of modem delivery practices of incremental incubation, rapid iterations and hacks supported by marginal cost economics unique to the digital realm.

Privacy Paradox in the Data Fuel and Exhaust

Data are both the fuel and exhaust of the digital economy. Having access to a higher volume of data enables the agents of the digital economy to generate more value by better understanding the economy, creating better products and services, and ultimately taking better decisions. However, individuals and groups pay a price in surveillance of behavior, loss of privacy and human agency over data.

An argument can be advanced that sacrificing privacy is the fair price to pay for better products, ease of experience, and inclusive access to services. However, the analysis of personal data can reveal human preferences and impulses, something that enables agencies and providers such as large Internet players, government bodies, and political parties to predict and persuade human behaviors. Entities that conduct deep data

analyses to understand human action mechanisms will continue to commandeer persuasion and power over humans.

In light of challenges of handling data fairly, a human-centered digital economy must serve purpose, provide human agency over its data, and mechanisms for privacy and freedom without being overly regimented. One such mechanism is a data cooperative: an agent that acts as a fiduciary on behalf of a group of people who gather their data and govern access to them. Data cooperatives permit payment by an outside party to individuals for their data and for insights derived from their data. By being part of data cooperatives, humans gain bargaining power, granular control of privacy, and the ability to exercise an active role as data analyzers – not just providers – in a digital economy.

When 19th-century workers became aware of the value of their labor, many sought to form unions, collectively negotiate, exercise political lobbying and bargain with the factory owners. As people get economic returns on their data, many will develop a data consciousness, fostering formation of new data cooperatives. At the same time, individuals will join a data cooperative only if the accounting is positive. If, by incurring costs to protect their privacy, individuals do not receive benefits they consider high enough, they simply won't engage. Data cooperatives need to find ways to monetize the data of their members in a privacy-preserving manner in order to offer them enough stake and incentive to join.

A further closely related concept is the data exchange. In a recent article that appeared in the MIT Sloan Management Review (Parra-Moyano et al. 2020), authors José Parra-Moyano, Karl Schmedders and Alex "Sandy" Pentland cite a number of currently operating data exchanges, including Ocean Protocol. The exchange collects data from individuals and organizations as well as other data exchanges. Driving data captured from vehicles' telematics systems, for example, can be used to improve software for autonomous vehicles or job satisfaction data might be used by companies to enhance the workplace culture and experience they provide. Such data exchanges are already used by companies in the pharma, aviation, financial services and consumer goods industries as well as governments. This model clearly demonstrates that sharing data transparently can be a win-win situation.

Nevertheless, with where we are today, the privacy paradox – the discrepancy between an individual's intentions of privacy protection and actual behavior online – has a large gap. Individuals claim that they care about privacy, but behave as if they don't. A possible explanation of this paradox is that the effort of taking steps to protect privacy is often perceived as disproportionate to the risk of sacrificing the privacy itself. As long as

the privacy paradox is valid, meaning individuals don't act in line with their intention to protect their privacy, it invites the following question: what would be required for individuals to start exercising power over their privacy by either protecting it, monetizing it or making a conscious decision that the tradeoff in terms of superior healthcare, education, government services etc. is a good deal?

As a thought experiment, consider that the following elements could move individuals towards a tipping point in the privacy paradox. First, firms can start offering privacy-based discounts to set themselves apart from competitors that do not pay for consumer data (or what is the same, higher prices for privacy preserving versions of their products). If a firm starts offering monetary discounts to its clients in exchange for data, then consumers choose the high-privacy, but expensive version or the low-privacy, but less expensive version. The average consumer will start associating data and privacy with money. Why would a firm offer a privacy-based discount or a privacy preserving version of its products? For one: to differentiate and compete in a privacy-respecting, human-centered digital economy.

It remains unclear when individuals (and societies) will reach the inflection point, but what seems clear is that they are steadily approaching it.

The Pathway to a Human-centered Digital Economy

Source: Recovery for People and Planet Campaign

The self-organizing system of systems and self-sovereign data cooperation translate into a future portfolio view of the human-centered digital economy. Traditional frameworks of the global economy and its measurements are generally looked at in terms of its parts, such as, by industry sectors, by countries, by economic regions, and by free-trade zones. The sheer magnitude of interdependencies in global trade, supply chains and mobility of people and resources necessitates a shift in attention from a collection of such parts to a cohesive whole. The economic science literature on externalities, where the action of one agent has an unaccounted impact on another agent – positive or negative – captures these interdependencies and cohesion among various parts of the system. A blueprint for the post-pandemic human-centered digital economy as a whole organizes for a spectrum or portfolio of the economy:

- Automated economy, which is run unattended by highly automated machines such as robotic factories and data centers.
- Presence economy, which consists of non-physical human presence of remote conduct or participation such as virtual work sessions and telemedicine.
- Physical economy, which is the portion of the economy that requires distribution and logistics of physical articles such as supply chains of manufacturing, finished and perishable goods – operating with or without human participants
- Person economy, which needs a human being present in proximity or onsite. Examples include vehicle drivers, first responders and emergency workers – until some of these tasks become robotic and autonomous

As we prepare for the shock after the shock, we need to shape a blueprint for a human-centered digital economy. It is enabled by inclusive interconnection of people, activities, and technologies across geographies. We must make our digital solutions privacy-respecting and flexible without disproportionate sacrifices in human-machine experience, societal value, and progress of a modern digital economy. Above all, our digital economies and convergent technologies place agency of humankind and the planet over and above everything else. We must not forget that the dialectic between humans and technology in a human-centered digital economy is not only about humankind: Our planet Earth is also a stakeholder at the table.

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