GOVERNANCE

Essay:
Hierarchy and Heterarchy

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We are on the cusp of something very big in the 21st century. Where singular hierarchical governance is ill-suited to serve, it can be argued that the digital landscape will rival nothing less than the Serengeti plains offered up to our hominid ancestors. We are compelled to evolve beyond hierarchical governance as we daily witness its failures. What is called for is a rather disruptive form of innovative governance – an organizational structure called heterarchy. It is a network by design of hierarchies. Implementing this form of governance will require a dramatic rethinking of leadership and the origins of organizational life.

HUMAN IMPERATIVES
Three imperatives for human connections form a mutually related set of elements for 21st-century governance. The first two imperatives of place and social proximity have been the mainstays of human culture for millennia. People convene in town halls and assemble in city squares because they cannot abandon that primordial need for intimacy and belonging. A third digital imperative emerges when we substitute space for place, generating a hybrid human connection. The three imperatives are detailed below.

The territorial imperative
Society and economy give primacy to physical structures and artifacts – monuments, buildings and city states. This territorial imperative is largely passive and rooted in place. Ironically, little thought is given to space. It's not surprising, as most of us don't see the shape of space, only the objects that occupy it. Walk into any call center, computer center and workstation. What do you see? The tools have changed, to be sure, but the actual layout of an office or a floor plan is not all that different from Bentham's late 18th-century panopticon – which refers not only to the built environment but to its governing philosophy as well. We delude ourselves into thinking that we work in a postmodern, sexy-cool virtual world, but despite enabling technologies we have advanced only incrementally in our ability to substantially change our institutions.

The social imperative
A more reactive social imperative that has evolved for millennia is physical propinquity – or proximity. People need people, and they need them to be close. Propinquity is a social imperative that catalyzes our need to belong, and as a result we assemble in tribes, teams and organizations. How tightly we are coupled in these organizational structures depends on our social structure, which, like the shape of space, we typically cannot see. There is one form of governing structure that is visible – that of hierarchy – but we know from research that hierarchies are poor proxies for revealing social DNA. Leaders see headcounts; they cannot see the social landscape but for the Dilbertian cubicles –

commonly referred to as hierarchical planning by architects and designers – in their line of sight. If they can't see how people are relationally connected, then they can't accurately value, in terms of social capital, either the people or their relationships. This social DNA has been the missing link in fully valuing, and therefore governing, the human asset.

The digital imperative

More recently, a new digital imperative has emerged – crowd sourcing where humans virtually amass and connect in space regardless of where they hang their hat. We connect in a vast Milky Way of virtual connections that is visually represented as a network and mathematically measured. But be warned, virtual chatter is largely transactional noise. Transactions are like traffic where the rules of engagement are mutually agreed and well understood. Real value is determining where the 'trust' hides out in all that noise. Trust is a species of connective tissue that absorbs greater shocks of uncertainty and ambiguity, and that is why trust is such a sturdy form of connection. This has implications for governance.

However, trust as a theoretical construct of connection was a bridge too far for most economists. Connection was envisioned as three different types of transactions and distinguished by Williamson as: coordination costs – once the contract has been signed and in keeping with authority-based exchanges, information costs (looking for the right people or information, which could be considered a form of networking) and bargaining costs (drawing up a perfect contract, or the road to trust). Sadly, no one has ever been able to measure transaction costs because authority and trust are considered modulators of an exchange, not a species of connection. If we shift the paradigm to construct a 'connection trifecta' consisting of trust, authority and transactions, then there are existing ways of measuring trust and authority.

But we haven't seized this paradigm and have languished in a state of malaise with our old forms of governance. This malaise was disrupted by a collision of the digital with the physical in the Arab Spring. Jump-started in the Twitter sphere, people gathered in Tahrir Square, as they tweeted up to meet up. There is a dynamism in the digital domain that contrasts sharply with a government's presumption of perpetuity. Governments have toppled, after all. To truly live long and prosper, different organizational blueprints are re-

quired. Blueprints of the industrial complex – hierarchical governance – are still needed, but there is also a new class of blueprint that addresses the construction of heterarchical governance.

ELEMENTARY STRUCTURES

Most of us lament the existence of big government, these great barrier reefs of red tape that famously tout the motto 'bigger is better'. Imagine if there was an iterative, underlying pattern governing the way governments morph into enormous proportions. For that matter, how does any organization scale? What if there was a 'structure' at the root cause of all this 'scale'. That's exactly what the French anthropologist Levi-

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Strauss reasoned like when investigating tribes of family structures in South America. He called these nucleic structures the "atom of kinship" (Levi-Strauss, 1955; 1969). In the end, his idea proved more provocative than practical. He wasn't wrong; he was just looking in the wrong place. There is a broader classification scheme; its genus is organization, and kinship – with its biological and fictive lineages – is one of its many hybrid species. What other species populate this genus?

Three elementary species come to mind: hierarchy, markets and networks. Economists believed hierarchy to be an island of planned coordination in a sea of market relationships, a pristine paradise inhabited by vertically integrated tribes of employees – adapted from Richardson (1972). At one end of a continuum, markets were considered to be the grand genesis of commerce. At the other end, there was hierarchy, the logical endpoint of civilization. A network was a theoretical interloper and often dismissed by economists as a mixed breed, a doomed hybrid. Those were

early days. Decades of theoretical research coupled with the practical realities of social media have reasserted the importance of the network and its relevance to cultural genesis and social DNA. Networks are after all, primordial; only later did clans, lineages and hierarchical nation states develop sufficiently to trade

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their surpluses in local, regional and global markets.

Ronald Coase's classic paper (1937) on the nature of the firm – e.g. hierarchy – suggests that firms and markets, while being different organizational structures, nevertheless share common transactional practices. The distinction, later amplified by Williamson (1976; 1985; 1993), was based on the amount of knowledge contained in a transaction – asset specificity. Disinterested, non-repetitive one-off exchanges occur as market transactions – simple contracts. The structure of this exchange is a dyad – two people linked together in an exchange. Dyads ground most of our assumptions

about market economies, personal relationships, contract law and marriage.

Exchanges that entail greater uncertainty – and therefore a proportional amount of asset specificity – are best sheltered within the firm as a way to mitigate greater risk. Theories of 'the firm' were conceived and characterizations of its hierarchical infrastructure were developed. Management theorists put their imprimatur on the debate with theories based on hybrid organizational forms and derivative managerial approaches, such as the U-form and M-form organizations and Theories X and Y (McGregor, 1957), and Z (Ouchi, 1981) respectively. A literal chain of command is the overarching structure in hierarchy.

Only much later did other researchers argue (Stephenson and Zelen, 1989; Stephenson, 1990; Krackhardt, 1990; Powell, 1990) for the existence of another organizational structure – a network. Networks aren't dyads – as in markets – and they aren't exclusively chains – as in hierarchies. An elementary network is a triad, built from adding one more person to a dyad. But a profound mathematical principle is revealed when this operation occurs. Adding one more person to a triad doubles the number of linkages and introduces the first indirect link in the structure. Perhaps this is what Levi-Strauss realized when he asserted that he was less interested in a ten percent increase in a population of 300 million, than in a two-person household becoming a three-person household. Triads absorb greater uncertainty, exceeding hierarchical limitations with aplomb. Nuanced and capable of asynchronous and asymmetric exchanges, networks deftly elude the visible hand of hierarchy (Chandler, 1977) and the invisible hand of the market (Smith, 1776).

The inclusion of a fourth organizational species – heterarchies – is recently noted (McCulloch, 1945; Stark, 1999; Stephenson, 2004; 2008; 2009). Heterarchies are a precise combination of networks with hierarchies. In the same way that a triad introduces the first indirect link in a three-person network, a heterarchy introduces its first indirect link in a three-hierarchy network. The definition of a heterarchy is as follows: A heterarchy is comprised of three or more different organizations – hierarchies –, each with its own raison d'être and no single entity privileged over the other. Networked together, these hierarchies share in the collective governance of the whole in order to achieve a greater good that no single entity could achieve on its own.

Elementary structures and exchange rates   TABLE 1

Organizational form	ABCs of exchange	Structure
Network	Mutually interested, repetitive exchanges	Three or more nodes arrayed in a triad (a triad is the smallest structure)
Hierarchy	Routinization through a governing authority	Chains of nodes
Market	Disinterested, non-repetitive transactions	Collection of dyads
Heterarchy	Mutually interested, collective governance characterized by asymmetric & asynchronous exchanges	Three or more hierarchies networked together as a triad

We know about heterarchies because of their spectacular failures, but heterarchies aren't dysfunctional by nature. They become dysfunctional when a leader of a single hierarchical entity naively privileges his interests over the whole. Said differently, leaders mistakenly assume that their special interests are the only things that matter. This is largely due to how they learned their tradecraft by practicing as CEOs or directors of singular hierarchies or, alternatively, they may have been educated in business schools which are grounded in 19th-century norms of leadership. Either way, these leaders are generally unprepared to manage and lead in heterarchies. A re-sequencing of social DNA is summarized in Table 1.

SEGMENTARY SYSTEM CONSTRAINTS

Heterarchies require much more than a coalition of the willing; they demand a well-designed and coordinated network to ensure the alignment of tasks across multiple and competing organizations. When tasks are not aligned, perverse outcomes surely follow (Box 1).

Heterarchical failures reach back into our primordial beginnings. Humanity began as a hunter-gatherer band. It was a nuclear family structure, simple enough, that grew into a tribe or clan. Primordial clans separated into segmentary lineages, then chiefdoms, right up to the modern-day state – or so the story is told. Regardless of whether this evolutionary tale is a true accounting, it is evident that our governance systems betray some aspect of this heritage (Sahlins, 1961; 1963). In the early stages of human organization, leaders were typically charismatic. A change occurred between the segmentary lineage and chiefdom, where leadership shifted from that of a charismatic leader – who built a following by creating loyalties through generosity, fearful acquiescence through magic, demonstrated wisdom, oratorical skill, etcetera – to that of an instituted office authorized by God, coup or chad.

When policies change or new needs arise, teams or departments are created not from the ground up,

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Examples from the United States

BOX 1

Three segmentary examples from the United States can be described that could and should have operated as heterarchies, but failed:

US military health care

In 2014, the US military health care system experienced an alarmingly high number of 'never events' – fatalities which are potentially preventable. The health care system is organized as a heterarchy comprised of four major players: Army, Navy, Air Force and the Department of Defense (DoD). When certain 'never events' were revealed in a New York Times' exposé, each member hierarchy blamed the others when in fact, the refusal to share patient data across the heterarchy is what led to the fatalities. As a former Army policy officer said to the NYT: "Why should the Army safety system want to play with DoD? Because then I have less control over my data, less control over my kingdom, and potentially DoD is going to tell me what to do."

2010 Gulf Oil disaster

The 2010 Gulf Oil disaster was a man-made collision of special interests, which resulted in a natural disaster of epic proportions. Multiple organizations such as Halliburton, BP and varied insurers were locked in contractual relationships when the disaster struck. In a diaspora of abdicating responsibility, organizations passed the blame. Rarely, if ever, did leaders see their kingdom as part of a whole network of interacting organizations. When leaders and boards attend to only their special concerns, perverse outcomes emerge. "No one wants this over more than I do. I would like my life back," said CEO Tony Hayward on May 31, 2010, regarding the oil spill disaster that claimed eleven lives and spewed 100 million gallons of toxic oil into the Gulf of Mexico. "We care about the small people," BP Chairman Carl-Henric Svanberg emoted to reporters in Washington on June 16, 2010.

Department of Homeland Security

A few years after 9/11/2001, an attempt was made to better protect the nation. The United States Administration created the Department of Homeland Security (DHS) to oversee national security by combining three separate government functions: intelligence (NSA, NRO, CIA as a few examples), policing (the FBI for instance) and disaster response (FEMA). Built from 60+ pre-existing departments, the new super-ordinate layer of authority only deepened the tug-of-war between the agencies for limited resources. The DHS was widely considered a failure. It was mismanaged from the outset, because simply putting a higher level of authority over competing organizations is no guarantee that they will collaborate.

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but as sub-units of existing segments mimicking cellular division. As the layers of smaller chiefdoms proliferate, they compete against one another, calling a truce only when a larger chiefdom threatens their existence. So, within a government department for example, one team jockeys for position with another, one directorate attacks another to protect its budget, and the department as a whole fights other departments to defend its turf. In these systems there is no internal structure or infrastructure to join the system as a whole; it is simply a collection of hierarchies or vertically integrated silos. As such, they are never more (and often much less) than the sum of their parts. Segmentary systems calculate power by comparing and contrasting their

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stock or status with that of other segments. If required, they will cannibalize other parts of the organization to preserve their part (Douglas, 1986). With additional stress, they will eat their young. This ruthless survival tableau describes segmentary systems, not heterarchies. Member hierarchies of a single heterarchy will suppress the killer instinct in lieu of collaboration with others because they understand that, if the higher objective is achieved, they will all be successful, and not at the cost of a peer.

When looking at the three examples described in the box, one can appreciate how segmentary politics easily and perversely thwarts overall objectives and goals. It should come as no surprise when people complain of being stuck in organizational silos because they are, and these silos are of their own making. What we don't realize is that we are hardwired to create these tribal silos because of segmentary system constraints held in place by cultural, procedural and measurement barriers. In segmentary systems there is no pre-planned

network in place to allow for the seamless exchange of vital information laterally among the different hierarchical organizations and no measurement system to ensure its sustainability. The result is that information disappears, deadlines are missed, fingers point and wrongs are papered over. If leaders could step back and see the whole instead of only their portion, then no one would have to die, pay amends, or bear the whole brunt of the blame.

Heterarchies are designed to solve crosscutting problems by leveraging crosscutting collaboration – for insight into how hospitals grappled and ultimately embraced heterarchy through the re-engineering of readmissions (Sobczak, 2014).

Most large conglomerates are heterarchies in name only. More likely, they behave as coalitions of the willing encouraging collaboration up to a point, until collaboration clashes with the chain of command (e.g. the hierarchy). Three ways to ensure sustainable collaboration are: account for it in policy, plan for it in network design, and incentivize it with consistent rewards that are integrated with individual performance measures.

CONCLUDING REMARKS

The directive of this article is to focus on theoretical concepts. Therefore, in closing, I now comment on methods that impact measurement, standards and policy.

As for measurement, methods of analyzing heterarchies are dangerously derived from social network analysis (SNA; sometimes abbreviated as ONA, for organizational network analysis). Unfortunately social network analysis as a general practice is young, and most practitioners are reduced to banal attempts at reading or diagnosing networks: closing gaps and dispersing cliques. There are no standards for diagnosing networks. and therefore no best practices to offer guidance on how to translate network metrics to incentives – for example, correlating centrality measures with performance reviews (Stephenson, 2011). The goal is to derive a more accurate valuation of the total human asset to ensure that people effectively work together for the common good.

As for standards, there are as yet no methods or standards for 'writing' networks, i.e. creating and designing networks as human way stations for connecting hierarchies into sustainable heterarchies. The 21st-century is a small, hot and crowded place, and fer-

tile ground for heterarchies to spontaneously form and disperse. We have been buffeted by their wicked unruliness in dispensing toxic information through education, health, finance and civil society (e.g. terrorism). We must develop and deploy best practices for the lifecycle management of these heterarchies, for otherwise we deserve the fate their failures demonstrate.

As for policy, one could argue that the call for standards in the practice and measurement of networks and heterarchies is a perverse outcome of antitrust policy laws enacted in the 19th and 20th centuries. The Sherman Act of 1890 and the Clayton Act as well as the Federal Trade Commission Act of 1914 were developed to regulate the conduct of business corporations – e.g. those hierarchical islands of planned coordination in the sea of market relations. Their alleged purpose was protecting competition, based on the belief that a free, unregulated market would inevitably lead to the establishment of coercive monopolies. The writer Ayn Rand and other laissez faire economists argued that if any coercive monopolies existed, they were due to government intervention, not the lack of it. Antitrust is now iconic; it insulates hierarchies from collaborating and undermines the credibility and sustainability of heterarchies. It's unsettling when government can break up an AT&T in the early 1980s with one hand, but cobble together a heterarchy called The Affordable Care Act in 2010 with the other hand. Clearly we need to rethink governance in the light of larger needs that only organizational conglomerates like heterarchies can meet. At issue is the greater moral good or, said differently, who is being served.

In the introduction, I suggested that we are onto something very big regarding 21st-century governance. The mixing of outdated 19th-century hierarchical policies – for example antitrust laws – with 21st-century social media has created a leadership vacuum that only heterarchical governance can fill. Effective hierarchical leadership is no longer a guarantee of success – our ever-shrinking world has seen to that. Heterarchical governance has quite literally evolved to meet our collective needs. Heterarchy unburdens us through better governance and may prove to be the antidote for outdated hierarchical policies that we could and should shrug off.

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