

A photograph of a busy public transit station, likely a subway or train platform. In the foreground, a woman with short dark hair, wearing a light grey t-shirt and a black shoulder bag, is looking down at her smartphone. Next to her, a man in a blue t-shirt is also looking at his phone. The background is filled with other people, some sitting on benches and others standing. A white network overlay, consisting of interconnected nodes and lines, is superimposed on the left side of the image, extending across the scene. A blue rectangular box is positioned in the lower-left quadrant, containing white text.

Network Societies

Understanding the Transition

Overview

The information revolution is often identified as the most profound driver of change in our world today enabling an ongoing disruptive transformation in the deep structure to our Industrial Age social institutions as we move further into the 21st century. Information technology has unleashed the most radical force of our time, hyperconnectivity, that is reshaping all areas of our technology, economy and social institutions according to a new set of rules, those of access, network structure, information, and knowledge. While the original revolution in technology may be behind us the social impact is still largely ahead of us, as in many countries there remains a deep contradiction between the existing institutional structures and those that would be adapted to their underlying information and knowledge economy.

Within such a context many people believe that we are on the cusp of a fundamental transformation in our political-economy, in how we choose to organize society in respect to industry, organizations, and communities. This is essentially the shift from the Industrial Age bureaucratic form of organization - that we all know very well, the hierarchical, stable, predictable organization which is formal and rule-bound, to social organizational structures that are better adapted and more characteristic of the Information Age, that is to say a post-bureaucratic form of organization which is much flatter, much leaner, much more network-based, much more informal, dynamic, open in scope, one that is really all about knowledge as opposed to execution and efficiency. What emerges out of this transformation is what has been called the network society.

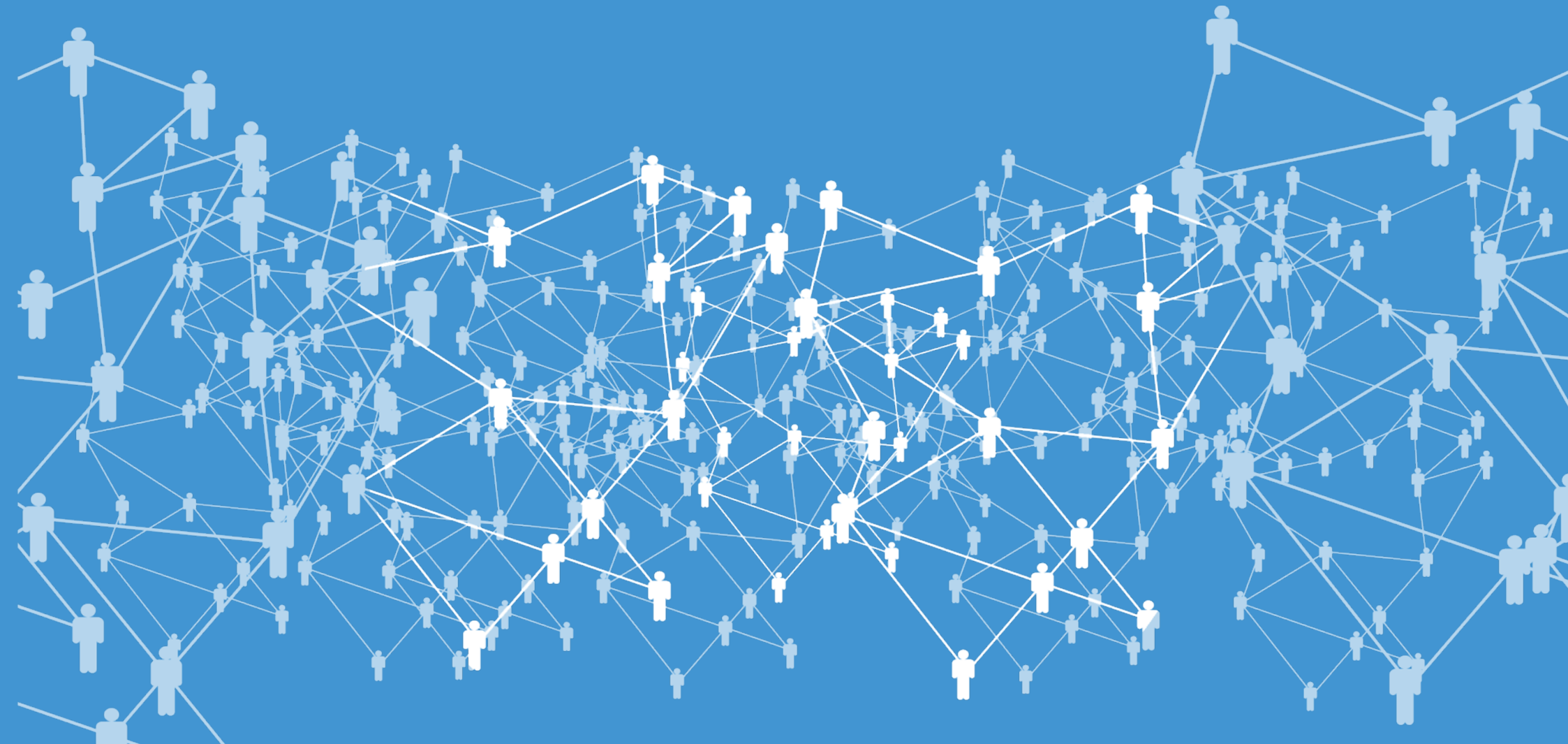
The network society is a social structure based on networks operated by information and communication technologies based on microelectronics and digital computer networks that generate, process and distribute information via the nodes of the networks. The network society can be defined as a social formation with an infrastructure of social and media networks enabling its prime mode of organization at all levels (individual, organizational and societal). Increasingly, these networks link all units on all scales of society.

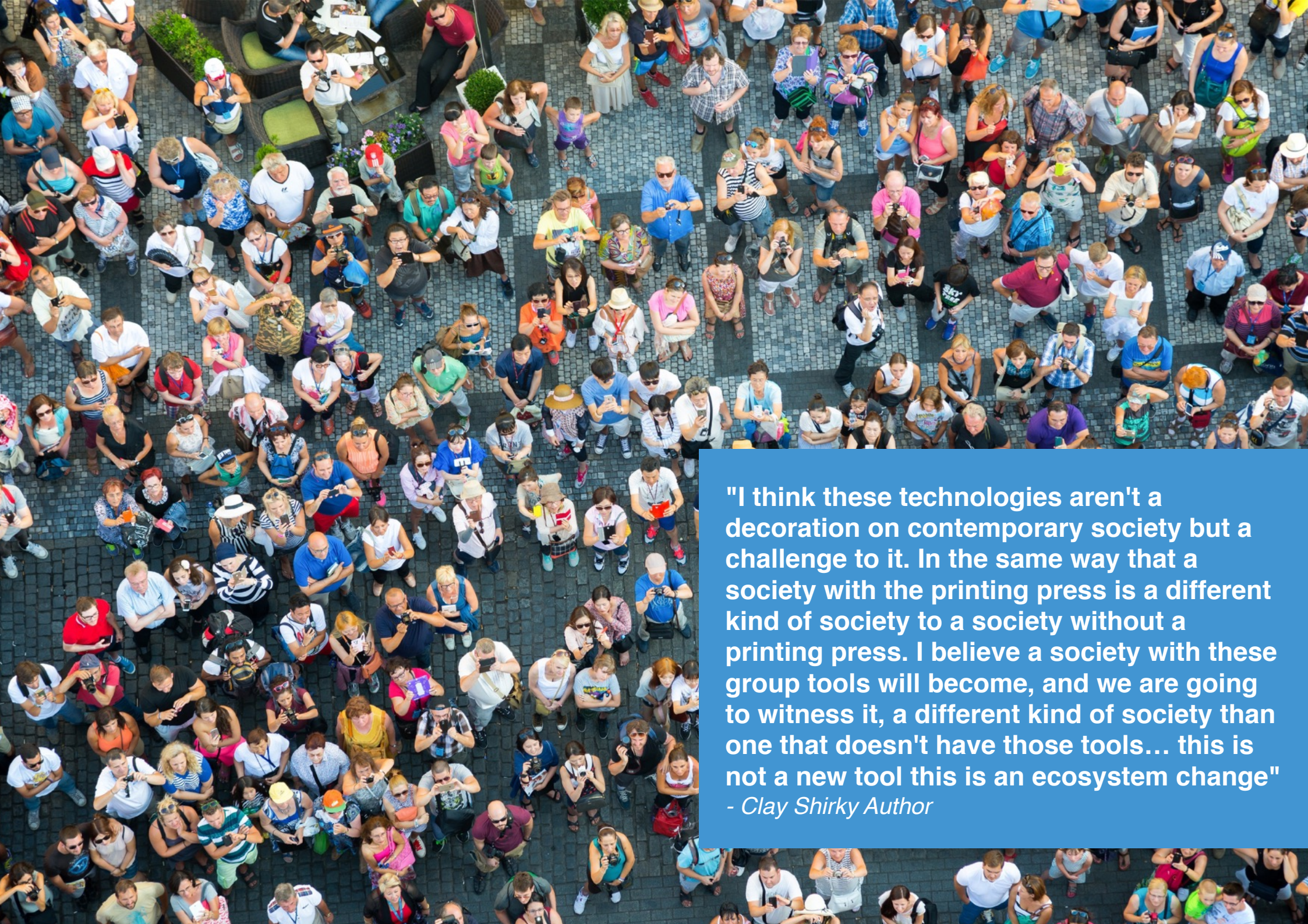
"In the last ten years the world has actually gone from connected to hyperconnected, this is, in fact, the biggest thing happening on the planet today and it is, in fact, driving every political social and economic trend in my view"

- Thomas Friedman Author

This working paper looks at some of the most salient features to this transformation in our social institutions which are engendered in the move into a network society. We talk about the evolution of communications technology that has brought us to the age of hyperconnectivity. How the pervasive, nonlinear and networked nature of communications in contemporary society works to erode traditional organizations based upon a linear flow to information. We look at the process of unbundling as the monolithic institutions of the Industrial Age become disaggregated and distributed out into modular and granular components that are then reaggregated through dynamic networks. Finally, we talk about the important role that knowledge comes to play in a post-industrial networked society as it becomes a central element to the makeup of organizations and the critical resource flowing through networks.

"There will be huge, disruptions and an increasing tension between the existing incumbent types of organization and the new ones and as we go through these radical changes the final stage of this transformation is what we call the **network society"** - *David Orban, Network Society Ventures*





"I think these technologies aren't a decoration on contemporary society but a challenge to it. In the same way that a society with the printing press is a different kind of society to a society without a printing press. I believe a society with these group tools will become, and we are going to witness it, a different kind of society than one that doesn't have those tools... this is not a new tool this is an ecosystem change"
- Clay Shirky Author

Social Systems

As a famous person once said, "Man is by nature a social animal" expressing the fact that human beings do not exist in isolation but in the course of our lives we interact and form recurring relationships with each other. We interact and we form shared understandings of the world around us through communications, we synchronize our actions and behaviors with others to enable our coordination into larger organizations. These recurring patterns of interaction and understanding between people we call institutions and a society is a group of people that share a common set of cultural and social institutions, through which they coordinate their activities and identify with each other.

These social institutions that make up a society are predefined solutions to perennial social challenges. All societies have to manage themselves in some way, and for this, we create the institution of government. All societies will educate their children in some way and for this, they will create institutions of education, in all societies, people will die and they will be mourned, children will be born and we will create the institution of the family to enable this process. Some of these institutions will be so critical to the order and stability of the community that we will create formal contracts and enforce them. We create what are called social contracts, an agreement among the members of a society to cooperate for social benefits. A social contract is an agreement to give over personal choices and actions to the collective in exchange for the rights and benefits that collective organization gives back to the individual. Since the beginning of human civilization, social contracts embodied within institutions have helped structure how people worked together as a community.

Societies are social groups that differ according to subsistence strategies; the ways that humans use technology to provide needs for themselves. Sociologists place societies in three broad categories: pre-industrial, industrial, and postindustrial. Over time, some cultures have progressed toward more complex forms of organization and institutional structures. Hunter-gatherer tribes settled around seasonal food stocks to become agrarian villages. Villages grew to become towns and cities. Cities turned into city-states and nation-states. At each state in this process of evolution new, more complex forms of institutions were formed to structure society. This evolution of social complexity has been a process of developing social institutions that are ever more populous, having to integrate more people, with the members becoming more diverse, more interconnected and interdependent. The evolved increase in complexity over time has change societies and their institutions in fundamental ways.

To connect and coordinate something has to be exchanged between the parts, some physical medium must affect each part in some way. Creatures in an ecosystem are interconnected in an overall organization through the exchange of energy and materials between them. Likewise, the parts of our body are interconnected and organized through the exchange of energy and materials. But this physical medium places inherent physical constraints on the capacity to interconnect and coordinate the system.

In the ever ongoing evolution of larger more complex systems of organization, ecosystems, and societies have developed ever more sophisticated ways to decouple the information that is being exchanged from the constraining physical means that supports it, in order to enable more efficient communications and more complex systems of organization to emerge. To enable the complex coordination within a large active mammal required the development of an electrical nervous system for rapid communications and coordination throughout the whole organism. To enable the coordination of large groups of humans required the creation of the spoken word; to coordinate empires required writing. This exchange of dematerialized information that enables coordination is what we call communications. As such communications is the essence of advanced complex organization and without it, there can be no advanced forms of organization.

A central part of communications is virtualization. The process of capturing the information inherent within some entity and symbolizing it. By encoding the information inherent in some phenomena into a dematerialized medium we are able to virtualize almost any phenomena. We can decouple the information inherent in something from the physical entity it is embodied within. The image of an animal once only existed as a part of the physical extension of the animal, but with drawing and pictograms we separated the two and this made it possible to exchange the information without its native tangible medium.

This virtualization process is an inherent part of communications, we have been doing it ever since we uttered the first spoken words or carved the first icons on cave walls. We used some relatively intangible medium as the substrate for encoding information about some real world phenomenon and exchanged the media. The intangible nature of the communications medium makes it possible to store more information, to exchange it faster and further and thus to develop more complex systems of organization.

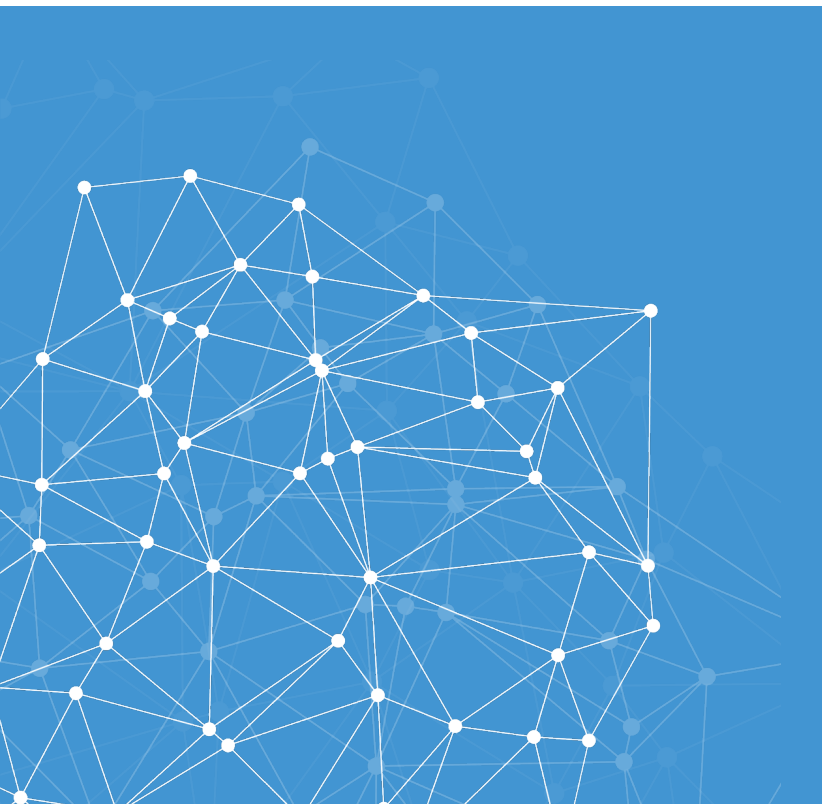


"Media shape what can be said, who can say it, who can hear it, how it can be said, in that way they also mediate relationships. Ultimately media are what allow us to connect with one another and they allow us to connect with each other in different ways depending on the medium, when media changes our relationships change"

- Michael Wesch Evolution of Communications

The evolution of communications has been a process of ever more sophisticated means for capturing the information inherent in some phenomenon, visualizing it by encoding it within an ever more intangible form and exchanging it through new protocols over ever greater distances at greater speeds. Institutions, being the interaction between people, will only ever scale to the level and complexity that interaction scales through communications. Throughout history, the means through which we have connected, the available means of communications has been directly correlated to our capacity to form complex social systems. Since prehistory significant changes in communication technologies has evolved in tandem with shifts in political and economic systems of organization as they have come to form new combined overall structures or paradigms of socioeconomic organization.

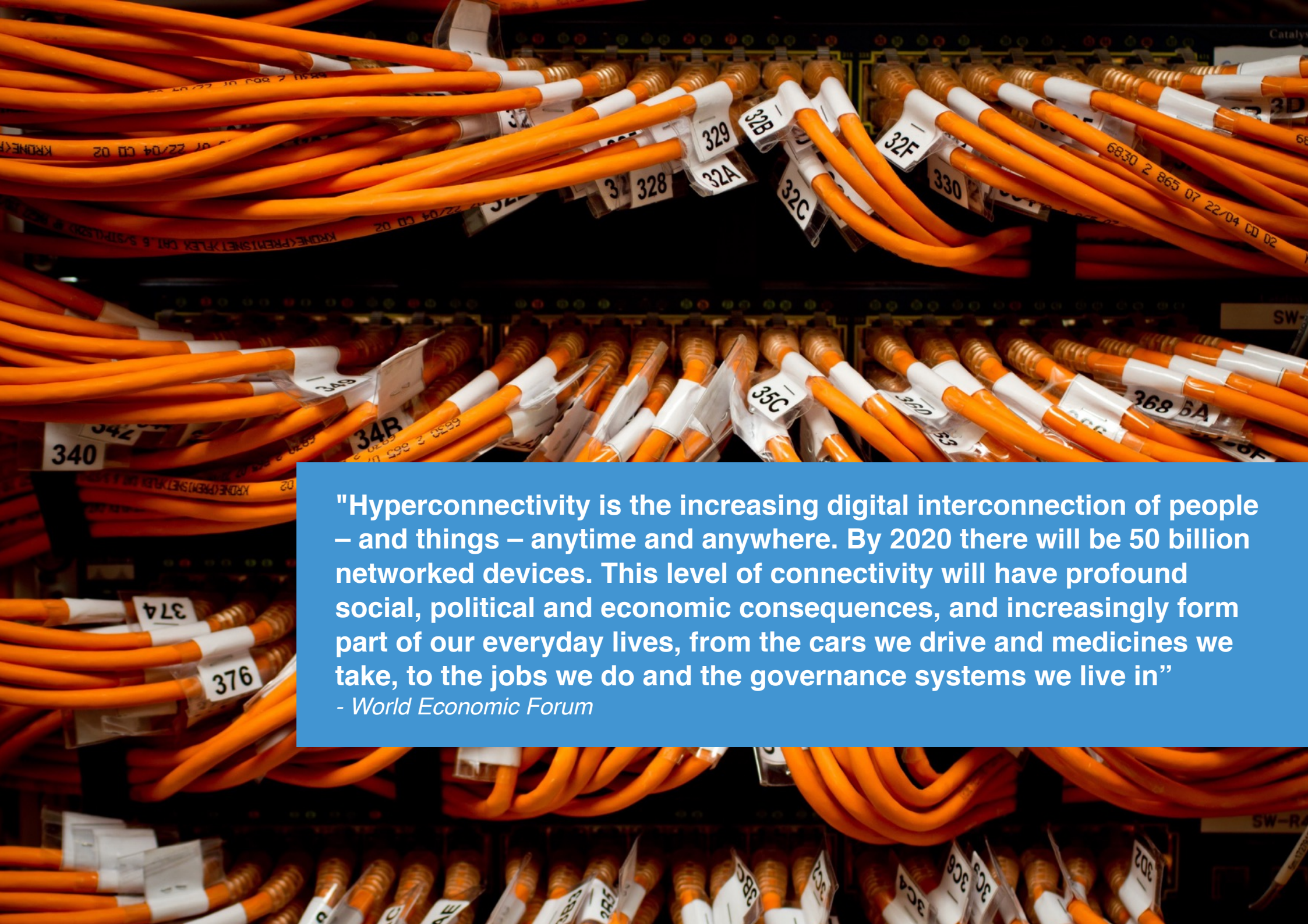
The first era of communications, that of the oral tradition, stretches from the time humankind first acquired speech, some 500,000 years ago, to the beginnings of literacy five thousand years ago. Human connectivity through communications was revolutionized with the origin of the spoken language. Oral communication can be thought of as the first form of telecommunications and would have greatly enabled small communities to exchange ideas, beliefs and coordinate around a common activity such as hunting or for cultural transmission between generations. The second era, the age of literacy, includes the period from the invention of writing to the discovery of electrical communications. Involving firstly the advent of written symbols, then the invention of the phonetic alphabet, and lastly the invention of the printing press. These innovations in communication technology paralleled the development of advanced civilization in Egypt and the Fertile Crescent where a postal system of couriers enabled them to coordinate their large empires with specialists in information storage and transmission emerging such as scribes, academies and courier systems. The harnessing of an external medium for the encoding and exchanging of information made information permanent and transportable over potentially very large distances. Knowledge and culture could be more effectively stored and transmitted from one generation to the next, systems of organization could be extended to whole empires spanning entire continents.



The arrival of the printing press and movable type at the beginning of the modern era marked a major information innovation in communications that had widespread social effects and may be seen as the origins of modern mass communications. The third communication era, that of the electrical flow of information and mass communications, covers the period from the first use of the telegraph in the early 1800s to the advent of personal computers. The harnessing of electricity to encode and exchange information led to a new set of communications technologies, starting with the telegraph and telephone as mediums for instant communications over a large distance at unprecedented speed.

After this came recorded media of all types, first image, then sound, then moving image with sound, then finally the ability to harness broadcast medium to communicate image and sound from one to many in real time. These new communications technologies went hand in hand with the new socio-economic systems of organization that developed during the Industrial Age. Where broadcast media promoted the centralized organization, such as the nation-state, where a large investment could be made in the centralized production of a message with this then being pushed out to a mass of recipients. With these communications technologies we had mediums where either we could create large groups but with only one-way communication, such as broadcast media, or we could create two-way communication but not in large groups, such as the telephone. It was the communication of the latter half the 20th century that was to change this paradigm.

With the rise of the digital format, microprocessor and global telecommunication network of the internet has come a new communication revolution. The past couple of decades has witnessed an extraordinarily rapid development of these new technologies, as processing capabilities consistently doubled every few years, storage price dropped and bandwidth grew. The exponential growth in these new communications technologies has made them rapidly cheaper, better and more accessible with the cost of communications radically dropping to enable a new paradigm for the capturing and exchanging of information. What is different about today's communications medium is the capacity to communicate from many to many over long distances at very low cost, and it is precisely this capacity that forms the foundations to a new form of networked organization. The network society is then this stage in the evolution of our communications medium and the new forms of more complex social institutions that are enabled by this nonlinear pervasive exchange of communications.



"Hyperconnectivity is the increasing digital interconnection of people – and things – anytime and anywhere. By 2020 there will be 50 billion networked devices. This level of connectivity will have profound social, political and economic consequences, and increasingly form part of our everyday lives, from the cars we drive and medicines we take, to the jobs we do and the governance systems we live in"

- World Economic Forum

Hyperconnectivity

At the heart of the idea of the network society, is the idea that we have moved from social systems defined by "things" to ones defined by connections. The idea that our social systems of organization are now more defined by their connections, communications, and organization, rather than the component parts and their properties. Connectivity and communications become the defining features of organizations shaping their dynamics, structure and what is possible.

Connectivity 'per se' is of course nothing new. For hundreds of years, people have been drawn to spaces where connections can be made: the forum, the cafe, the marketplace. However, the power of digital connectivity makes social interaction all pervasive. Any time, any place, anywhere and anyone. Access to connectivity is not hierarchical in the traditional sense but flows horizontally and is linked to access to technology.

This hyperconnectivity can be understood as a paradigm shift in communications when a society shifts from a linear communications model to a nonlinear communication paradigm. Instead of information flowing in a well-defined direction between a limited number of points, at particular times and places. In an information society, communications exchange becomes pervasive, it comes to flow in multiple directions between all points, continuously.

This pervasive exchange of information comes to create a new form of organizational structure, what we call a network, with organizations and individuals then becoming based around and defined by connectivity and access to these networks. As the volume of exchange along channels and the number of channels of exchange a node has increases, it becomes increasingly defined by that exchange as opposed to any of its inherent features or boundary. As connectivity increases the emphasis shifts from ownership by closed organizations within a context defined by physical constraints, to access through open organizations within a context defined by one's location within a network of connections.

A young woman with dark hair tied back in a ponytail with a pink scrunchie is looking down at her smartphone. She is wearing a dark blue jacket and carrying a large, light-colored shoulder bag. The background is a blurred subway station with other people and tracks.

A Network Society

“A society whose social structure is made up of networks powered by micro-electronics-based information and communications technologies”

- *Manuel Castells*

Society traces the profound global changes initiated by the information technology revolution back to the 1970s. The result was that society in all of its manifestations was restructured into the form of the digital network, an interlinking of specific nodes into an ever-expanding, information-based structure with its own global logic. In this new topology, global finance, societies, and capitalism itself have become restructured in a very profound way to become a network or network of networks.

The network society is what emerges out of this nonlinear pervasive communications. Networks operated by information and communication technologies based on microelectronics and digital computer networks that generate, process, and distribute information become the defining structure, people and organizations become defined by their roles as information and knowledge producers and users within different networks. In a network society, it is the connections and technology that enables the exchange of information along those connections that become more important than anything else. The characteristics of units and elements - among them human individuals - and their features, are not the focus of attention anymore, instead it becomes the whole network that matters more than any part.

This rise to prominence of networks within complex social systems can be interpreted along a number of dimensions but in purely mathematical terms it can be understood by the fact that whereas the number of elements within a network will grow at a linear rate, as in 1,2,3,4... the number of connections between them may grow at a superlinear rate, 0,1,3,6,10... However, this potential for exponential growth in connectivity will only be realized when the communications channels become nonlinear, which is what has happened in the past few decades. Thus when we go from a small social organization to a larger more complex one we will invariably go from one dominated by the individuals to one dominated by the connections, as long as there is nonlinear communications so that they can connect peer-to-peer and this is exactly what has just happened. We may have had complex societies before but it is only recently that we have had both complexity and the nonlinear tools for mass communications. This combination has created a paradigm shift in communications that will in turn feed through to a paradigm shift in social organization.

Societies depend upon their economies and available technology. Although they may not be determined by them, widespread and sustained social transformation can only really happen when new economic and technological means make it possible. The network society concept is based on the idea that social evolution is not determined by technology but it is enabled by technology. Society shapes technology according to the needs, values, and interests of people who use the technology but at the same time technology sets the parameters for what is physically possible.

Networks throughout history had a major advantage and a major problem vis-a-vis other forms of social organization. On the one hand, they are the most adaptable and flexible organizational forms, working well in many situations of informal organization. On the other hand, in the past, they could not master and coordinate the resources needed to accomplish a given task or fulfill a project beyond a certain size and complexity of the organization required to perform the task. Thus, in the historical record, networks were the

domain of the private life, while the world of production, power, and war was occupied by large, vertical organizations, such as states, churches, armies, and corporations that could marshal vast pools of resources around the purpose defined by a central authority. What is new is the microelectronics-based, networking technologies that provide new capabilities to an old form of social organization: networks. Digital networking technologies enable networks to overcome their historical limits. They can, at the same time, be flexible and adaptive thanks to their capacity to decentralize performance along a network of autonomous components, while still being able to coordinate all this decentralized activity towards a shared purpose. Digital communication networks are the backbone of the network society, as power networks (meaning energy networks) were the infrastructure on which the industrial society was built. Furthermore, because the network society is based on networks, and communication networks transcend boundaries, the network society is global, it is based on global networks.

"As we have all seen from the Arab Spring to Wikileaks new technologies are enabling more people everywhere to discover and share information and opinions. What is happening, it is exponentially easier to make more information, more transparent and to subvert control"
- April Rinne Sharing Economy Advisor



New Structures

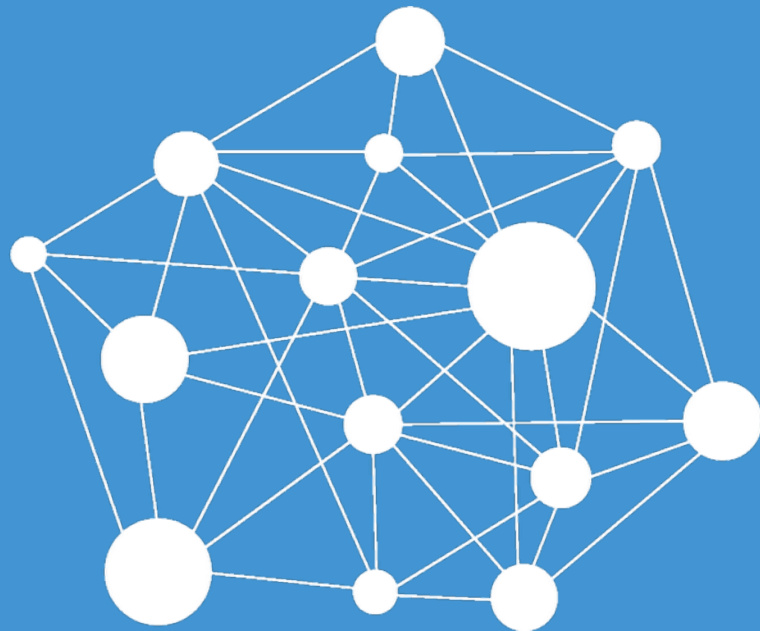
Connectivity both destroys and creates. It brings down borders, walls and boundaries and the structure that they support. But as it does so it also creates the grounds for new structures to emerge. In an information society, we go from a world of scarcity and closed organizations defined by their boundaries, to a world of abundance and open systems. We go from closed hierarchical systems to open platforms and management shifts from people to algorithms. This structural change to our systems of organization created by hyperconnectivity is one of the most fundamental processes of change taking place in our world today on all levels, across all organizations.

In a networked world, traditional institutional structures that are predicated on the flow of information in a linear fashion and a monopoly over the means of production and organization are rendered less and less effective with every new horizontal connection that is made, with every new software platform for social coordination that comes online. This flow of information along networks comes to restructure human institutions and human experience away from a linear sequential model to a nonlinear asynchronous model. It disaggregates existing linear processes and recombines them in new ways through networks.

As the network society diffuses, and new communication technologies expand their networks, there is an explosion of horizontal networks of communication and the collapse of context leads to decontextualization, both social, cultural, political and economic. Previous processes that were integrated become decomposed as communications technology allows us to disaggregate them. Power is separated from political representation, production from consumption, information from communication. For example with globalization, we have seen the unbundling and distribution of production processes into global supply networks. At the same time, things that were previously separate converge and become combined. Using the internet brings the “whole world” into our homes and workplaces, we see what someone we have not met for four years is eating for their breakfast as we flick through our social stream.

Lack of spatial, social, and temporal boundaries makes it difficult to maintain distinct social contexts. Traditional context that was defined by location and boundary get collapsed and collide in unexpected ways that may have positive or negative outcomes. Without context, traditional public and private domains become blurred. Public and private become meaningless in some context and in this we start to see privacy contested and confused.

Networks unbundle elements from their previous configuration that was defined by the constraints of space, time and information and then make them available within new patterns of organization based upon the structure of the network. Social systems are both individualized and highly modular/granular but also morph into ever larger global networks. The scale of the network society is both extended and reduced as compared to the mass society, as it is both global and local, sometimes indicated as “glocal”. The organization of its components (individuals, groups, organizations) is no longer tied to particular times and places.



**“The logic of the network
is more powerful than the
powers of the network”**

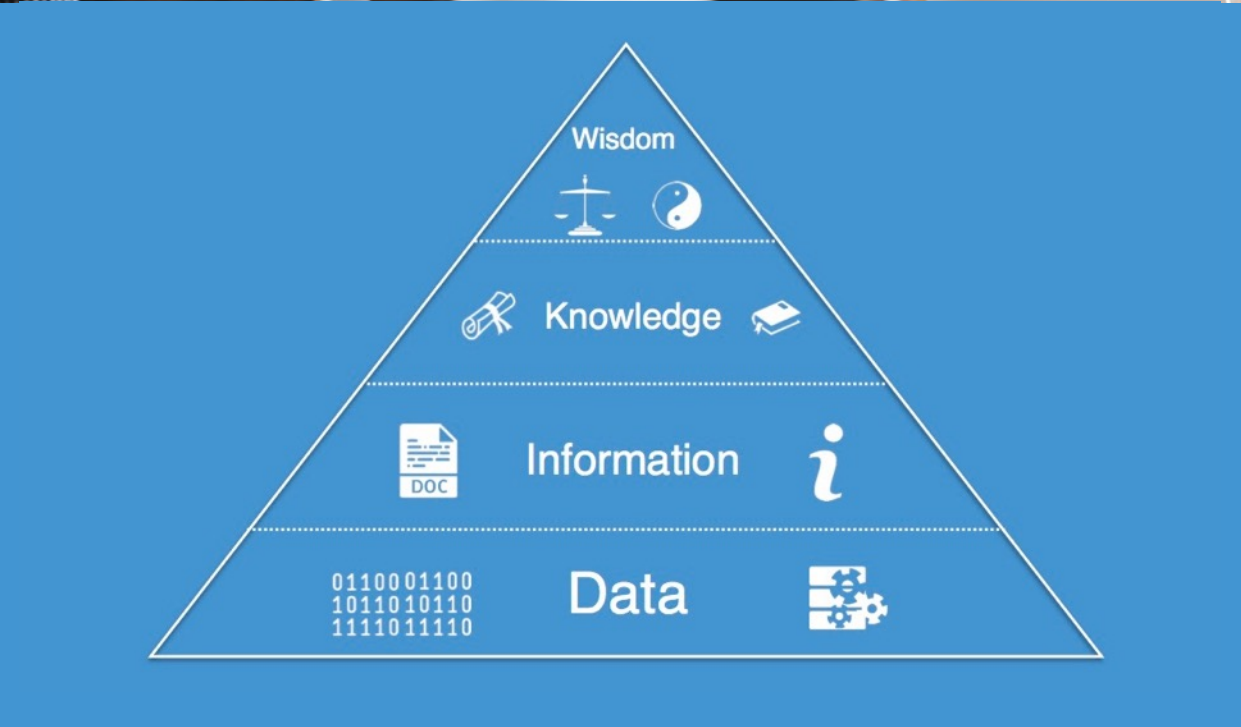
- Manuel Castells

Information - Knowledge

The development of a network society involves the restructuring of socio-economic organization around networks where individuals and organizations process information and knowledge. A network society is what emerges when an industrial economy has been commoditized, and information technology makes the processing and exchanging of information likewise a commodity. As such we can say that the networked organization is an evolution of our social structures that is designed to optimize the processing of information and ideas within society and economy. In the same way that, the bureaucratic hierarchical and well-bounded organization of the Industrial Age was optimized for the technologies and economic processes that were taking place within that society, the network as a socio-economic structure that is aligned with the underlying physical flow of information is one that is optimized for the processing of information and ideas that takes place within post-industrial economies as a primary activity of value generation.

The new structures that emerge in an information society are based on the processing of information and knowledge and out of this a new form of hierarchy forms. A hierarchy that is no longer based on space and the processing of physical resources, it is a hierarchy based upon the relationship between information and knowledge, this relationship is defined by what is called the DIKW framework which describes the hierarchy of data, information, knowledge and wisdom. Those working with the physical systems that generate raw data at the lowest level, the building and design of the software platforms and algorithms that run them higher up and those who work with the knowledge required to build all these systems having the most valuable position.

The knowledge pyramid defines a purported functional relationship between information and knowledge, where lower levels comprise the material or building blocks for the higher levels. Going up the hierarchy requires synthetic reasoning that integrates and synthesizes the building blocks into more organized and generic pattern. Going down the hierarchy involves analytical reasoning, wherein more generalized concepts are broken down into their constituent parts. Moving up or down the hierarchy defines a process that involves greater, meaning, context, subjectivity, and automation. Data is the oil of the information economy and value is in processing it into higher levels of organization, information, and knowledge, that value of one's role in these networks is in how you process information or knowledge.




Inclusion-Exclusion

Just as access to the physical resources of production formed the divides within an industrial capitalist economy, so too divides form within an information network society, divides base upon one's value to the network and one's capacity to process information and knowledge. Despite the disintegration of traditional divides around the physical means of production between capitalists and the proletariat, differentiation remains based upon access and processing capabilities, however, the resources have now changed.

In research by the famous sociologist Manuel Castells he analyzes the new hierarchy and divides as such: labor is fundamentally divided into networked labor, which serves the goals of the network, and switched-off labor, which has nothing to offer the network and in the context of the network economy is non-labor. Networked labor is itself divided into two groups. Self-programmable labor – such as financial analysts, company officers, journalists – manages information; it is flexible and skilled. Its interests coincide with the goals of the network. Generic labor (including many workers in natural resource, manufacturing, and service industries, also minimum wage and sweatshop labor) is unskilled, interchangeable and disposable; for these people, the goal is simple survival so as not to be relegated to the class of switch-off irrelevant labor.

Power in a network society is based on inclusion or exclusion from access to networks. Hence, resistance to the rise of networks comes from communities oriented around physical space and production. Those dislocated or excluded by the network society, such as unneeded labor, naturally gravitate to identities of communal resistance, creating a divide between local and global, between networks and traditional institutions such as the nation-state.

A satellite view of Earth at night, showing the illuminated landmasses of North and South America. The lights from cities and towns create a dense, glowing pattern across the continents, with the oceans appearing dark. The image is taken from a high angle, showing the curvature of the planet.

"The global network economy is based precisely on integrating people who have value; territories who have value and excluding people, territories, etc. that have no value as either producer or consumer"

- Manuel Castells

Transition

The evolution of our socio-economic systems of organization into a networked society is an ongoing process of creative destruction, a massive transformation that is happening at an extraordinary rate of change, that no one is really prepared for. As interconnectivity increases and bonds organizations into new networked structures, the traditional context that supported Industrial Age institutions starts to be eroded and disintegrates. When nations and societies become more connected than not, there is a tipping point, and new organizational structures that are aligned with the new context of heightened connectivity need to emerge.

This increase in connectivity due to globalization and information technology is a systemic transformation which means that it transforms the overall context and it is nonlinear in the sense that it is distributed out. It is not something that happens to one component part, it happens to many small parts restructuring how they are interconnected and interrelated and thus over time the overall context of the system changes. Traditional institutions go on existing but increasingly the context that originally created them - provided their reason for being and ultimately supported them - is eroded and gradually disappears, in the same way, that the rise of modern science gradually eroded the context for the institutional dominance of the Catholic Church in Europe. Social, economic and cultural inertia means that they go on existing and may even temporarily provide some order and structure within the new context as they appear to function.

However, eventually, some event happens that they are not capable of responding to, the result is the occurrence of a shock as the weakness of the institutions that society depended upon becomes revealed in the face of the new context. The question at that stage is whether alternative appropriate solutions have been sufficiently developed to maintain some form of stability in what is inevitably be a volatile and somewhat chaotic period. Within such a context, we can say the organizational structure to the global economy is at a bifurcation point. The traditional Industrial Age systems of socioeconomic organization are in a state of paralysis and disintegrating along many dimensions. National institutions and national political parties have not been able to formulate or articulate responses to the challenges that their communities face, the things that matter to the ordinary people, questions of inequality, jobs, climate change, migration, multiculturalism, and identity.

People want change but no one is able to understand and communicate a clear vision that is able to respond effectively to the complexity of the challenges they face. In the absence of order, vision and leadership far right political organizations have and will continue to exploit this to their advantage presenting simple solutions to complex challenges that don't work but will appear appealing in the absence of alternatives.

As we transit into a new form of global, services and information economy the traditional organizational structures that provided the mass of people within advanced economies with order during the Industrial Age are disintegrating, whether we are talking about stable jobs, a sense of potential progress for the middle class, or sense of national community and identity. A bifurcation is emerging with the rise of the right, on the one hand, offering the possibility for disintegration into a drastically simplified form, or, on the other hand, the evolution of new global IT-enabled platforms that can present new forms of organization and order aligned with the new reality of globalization and technology change.

"When a system, any kind of system enters a moment of bifurcation and is, therefore, coming to an end, two things happen. The structure becomes chaotic, and secondly, it becomes one in which small input gets great output, as opposed to a normally functioning system in which great input gets great output. That is very important to remember because that means we are in a chaotic, confused situation in which there is going to be real struggle about the new order that is going to be constructed and in which our behavior really matters. Which is to say unlike fifty or a hundred years ago when we worked very hard and organizations worked very hard and didn't get very far, the revolutions didn't turn out to be so revolutionary. Now very little input will get very great output, every little touch by us in the next 20 to 50 years is going to have a big impact and it may not be the impact that we want if we touch it in the wrong way"

- Immanuel Wallerstein Yale University



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