

Lecture 13:

Social Constructivism versus Technological Determinism

Course: Science, Technology and Society Studies

Technological Determinism

Technology as a transformative power, inexorably driving history.
Computers, TV, jet aircraft, antibiotics, contraceptive pills...

Technology as the “cause of” social change (in institutions/practices/ideas) in history:

- The Printing Press (and the Reformation)
- Eli Whitney’s cotton gin (and the Civil War)
- Automobiles (and the growth of suburbs)
- Snowmobiles in Finland (and transformation of the herding community). See pages 86-87 of Winner’s *Autonomous Technology*.

Hard Determinism: Technology has life of its own, power to effect change, leads to inescapable situations. Technology as AGENT.

Soft determinism: Role of material, geographic, demographic, socio-economic, intellectual, cultural, ideological factors. Technology as a dependent variable. (EXAMPLE: History of innovation)

Heilbroner's Technological Determinism

- Technology determines “the nature of socioeconomic order”
- Technological development “imposes certain social and political characteristics” upon society.
- Technology as a “mediating factor”, important though also influenced by socio-economic forces.

Technological development HAS TO follow a SEQUENCE!

Hand-mill -> Steam-mill -> Hydroelectric plant -> Nuclear power age.

WHY?

- SEQUENTIAL and DETERMINATE course of technology:
Technological clustering. Progressive nature of knowledge ->
New technological course.
- Absence of technological leaps.
- Predictability of technology. Dependence on accumulated stock
of available knowledge, presence of material competence/skill.

Heilbroner's Technological Determinism

Social-Technical relations

- Composition of the labour force: Inherent relationship between technology and nature of workforce (hand-mill versus steam-mill).
- Hierarchical organization of the work: Man-master relationship versus man-manager confrontation. Nature of organization of the workforce (hand-mill versus steam-mill).

Factory floor requires the MANAGER, even in communist USSR.

Heilbroner's Technological Determinism

Technology and Material Life:

- Changing material reality and daily life. EXAMPLES:
Railways/metro/motor car. Changing Where/What/How.
- But? Limitations. Veblen and Marx's overreading.

"The machine throws out anthropomorphic habits of thought" – Veblen

"Modern industry, resulting from the railway system, will dissolve the hereditary divisions of labor, upon which rest the Indian castes, those decisive impediments to Indian progress and Indian power" - Marx

Economics as Force Field: Economic determinism (e.g. augmentation of fortune) APPEARS as technological determinism. Technology is just a 'mediator', allowing economic maximization (and social reordering).

Heilbroner's Technological Determinism

Technological progress as social activity:
How do we explain differences in
technological development across time
and space?

- Technology as responsive to social direction: Social constraints on technology. Role of rewards, incentives, inducements.
- Compatibility with existing social conditions: Labour-saving machinery in labour-intensive society? Mass production without a mass market?

Technology as mediator.

“The steam-mill gave us the industrial capitalist, and the rising inventor-manufacturer gave us the steam-mill”

"Technological determinism is thus peculiarly a problem of a certain historical epoch—specifically that of high capitalism and low socialism—in which the forces of technical change have been unleashed, but when the agencies for the control or guidance of technology are still rudimentary" -

Bruce Bimber's Technological Determinism

THREE accounts of technological determinism:

- Normative account
- Nomological account
- Unintended consequences account

NORMATIVE Account

- Developed by Habermas.
- Habermas asks: HOW can society exert conscious, willful control over technology? Let public and private goals drive technology?
- When norms of 'efficiency', 'productivity' drive goal making, technology becomes deterministic.
- Leads to loss of political and ethical perspectives.
- Technology is autonomous and deterministic ONLY when society accepts technologists' standards of judgement.

Bruce Bimber's Technological Determinism

NORMATIVE
Account

KEY here is NORMS
of practice.

Technological
determinism
requires that
technological norms
be REMOVED from
political and ethical
discourse.

Ellul as classic
example:
“Domination of
social, political and
economic life by
logic and efficiency”.

Habermas's fear points us toward the essence of a first interpretation of technological determinism: norms of practice. Habermas suggests that technology can be considered autonomous and deterministic when the norms by which it is advanced are removed from political and ethical discourse and when goals of efficiency or productivity become surrogates for value-based debate over methods, alternatives, means, and ends. This is technological determinism's most familiar face, and I call this a Normative account.

Bruce Bimber's Technological Determinism

NOMOLOGICAL Account

“Given the past, and the laws of nature, there is only one possible future”.

- Laws of nature rather than social norms, decide historical trajectory.
- Technological processes require forms of organization/ political resources. Railways -> Organized steel-production facilities, pool of labor, capital, insurance and banking industry.
- Technology -> Fixed and predictable course of economic, social, and cultural change.
- NO cultural or social determination involved.

Bruce Bimber's Technological Determinism

Unintended consequences account

- Uncertainty and uncontrollability of actions.
- Impossibility of anticipating consequences. Even ethical concerns
-> unintended ends. EXAMPLE Horses and motorcars.
- Not determinism, but “indeterminism”.

BIMBER: No such thing as “hard” and “soft” determinism. If technology is influenced by norms/culture it cannot be “deterministic”. Keep society and technology “definitionally distinct”.

ONLY nomological accounts are TRULY technologically deterministic.

Thomas P Hughes' Technological Determinism

Technological Systems:

- Both society shaping and socially constructed.
- System construction requires DESTRUCTION of alternative systems: "*Management structure of an electrical system depends on the character of the functioning hardware...In turn, management in a technological system often chooses technical components that support the structure or organizational form of management*".
- Multiple (physical, social, economic/financial, political) components. Change in one -> Change/adjustments in the others.
- "Problem-solving": Involves tinkering with *both* physical and social elements. Example: Creating demand for specific appliances to increase load during desired time periods.

Thomas P Hughes' Technological Determinism

Phases of evolution of technological systems:

- Invention: Can be conservative and radical. Needs inventors, inventor-entrepreneurs. Holding companies, power plants, light bulbs.

Inventors: Inventors, managers and financiers
(Bell/Edison/Marconi).

- Development and innovation: Inventions -> Innovations. Social, political, economic characteristics are embodied in inventions for creation of technical systems that survive. Testing in multiple scenarios. EXAMPLE: Edison, Gibbs.

Inventor -> Manager-entrepreneur.

- Technology Transfer: Need for adaption to varied social/economic/political/geographical/legislative environments.

Technological style: Differences across time, region, nations: Big and few/Centralised (Berlin) versus small and many/decentralized (London). **Role of politics and history (copper and coal)**

WHY?

Thomas P Hughes' Technological Determinism

Phases of evolution of technological systems:

- Growth, Competition and Consolidation: Multiple paths to meet (conflicting) demands of increasing demands, varying load cycles.
- Dealing with “reverse salient” (a lagging element):

“In each stage in the growth of the system the reverse salients elicit the emergence of a sequence of appropriate types of problem solver-inventors, engineers, managers, financiers, and persons with experience in legislative and legal matters”.

Momentum: Related to vested interests, sunk costs, fixed assets.

Example: survival of DC currents.

Thomas P Hughes' Technological Momentum

- Between technological determinism and social constructivism.
- Younger technological systems are more open to social/cultural influence. Older, more mature systems more independent, more deterministic.
- Time-dependent, society to society and culture.



Thomas P Hughes' Technological Momentum

The I.G. Farben story:

- Early 20th century: Farben developed the Haber-Bosch Process to extract nitrogen (for fertilizers and explosives) from the atmosphere.
- Farben scaled up its operations. Required a large amount of advanced technical and physical equipment. This was the “momentum”.
- Momentum -> informed future decisions. Farben diversified into “coal hydrogenation” (making gasoline from coal).

Social and Political links:

- Expensive and non-competitive coal hydrogenation -> Lobbying with the Nazis for high import tariffs -> Enduring political links.

Thomas Misa's Technological Determinism

Macro-level studies -> Technological Deterministic

Micro-level studies -> Social constructivist

Need to concentrate on the “meso-level”: Conceptually intermediate level between firm/market, individual/state.

Manufacturers' organisations, standard setting-bodies, export-import firms, consulting engineering firms, investment banking firms.

Vertical integration in the steel industry appeared RATIONAL, FUNCTIONAL and order-driven ONLY in hindsight.

The role of Henry Oliver: Oliver's initial acquisition of mines had NOTHING to do with vertical integration. Promoted downstream integration with mines later. Carnegie agreed reluctantly.

Rosalind Williams' Technological Determinism

- Enlightenment conception of progress -> Technological determinism.
- Technological determinism slays “God the Father and *also* Mother Nature” -> declares humanity’s liberation from spiritual and natural necessity.
- Technology as global REVOLUTION.

Need to question the Enlightenment conceptions.

Look for Political and Feminist dimensions:

What is the VALUE SYSTEM of technological systems?

Rosalind Williams' Technological Determinism

- Not enough to study economic agendas and 'rational' motives.
Look for the ideological and political agendas.
- Need to contest the Enlightenment conception: Technocratic systems CAN and often ARE designed for authoritarian purposes of domination and control.

Mumford's distinction between 'democratic' and 'authoritarian' technics is a useful starting point.

"Democratic technics is the small scale of production, resting mainly on human skill and animal energy but always, even when employing machines, remaining under the active direction of the craftsman or the farmer"

WHO has an interest in democratic technics? And based on WHAT criteria?

Rosalind Williams' Technological Determinism

The question of gender: Isn't technological determinism a masculine point of view?

- Role of women: WHY has womens' contribution to 'democratic biotechnics' been routinely undermined?
 - Heilbroner's 'rational-economic' explanation does not explain how women (through culture and law) have been excluded from the economic process.
 - Mumford's explanation proposes that male elites have undermined feminine role in bearing and sustaining life and lifesystems.
- Existing BIAS in focussing on production rather than users -> inattention to the role of women.
- Feminist technology: Forging links between social and organic/natural, human and non-human. Stemming from a DIFFERENT perspective. EXAMPLE: Ecofeminism.



'American Dream': Painted in 1872, John Gast. Depicting the movement of 'Progress'

Technology as Progress

Gast's Progress:

- Progress with slender wires of the telegraph in her hand
- Progress bringing Railroads, steamships and the urban landscape with her.

“Everyone is happy EXCEPT that snarling bear and the wretched Indians in the lower left hand corner”.

HOW and WHEN did *technological advancement* become an inseparable element of ‘progress’? As an END in itself?

- The Enlightenment Belief in Progress
- The Technocratic Concept of Progress
- The Roots of Adversary Culture

The Enlightenment Belief in Progress

The Republican Doctrine:

- Progress as SOCIAL and POLITICAL liberation.
- Sciences and technologies NOT as ends in themselves, but as instruments for carrying out a comprehensive transformation of society.
- New knowledge and power would provide the basis for alternatives to the deeply entrenched authoritarian, hierarchical institutions.

“Science had liberated the ideas of those who read and reflect, and the American example had kindled feelings of right in the people. An insurrection has consequently begun, of science, talents, and courage, against rank and birth, which have fallen into contempt... Science is progressive” – Jefferson.

The Enlightenment Belief in Progress

Jefferson: "*Let our workshops remain in Europe*".

WHY?

- The factory system -> urban proletariat. Working class was seen as incompatible with republican government and happiness of the people.
- “Overall quality of life”, moral, aesthetic values > Economic benefits.
- Franklin: technology was to uplift all of society, serve others. SOCIAL value of technology was its rationale.

Technocratic Concept of Progress

"It is an extraordinary era in which we live. It is altogether new. The world has seen nothing like it before. I will not pretend, no one can pretend, to discern the end; but everybody knows that the age is remarkable for scientific research into the heavens, the earth, and what is beneath the earth; and perhaps more remarkable still for the application of this scientific research into the pursuits of life...We see the ocean navigated and the solid land traversed by steam power, and intelligence communicated by electricity. Truly this is almost a miraculous era. What is before us no one can say, what is upon us no one can hardly realize. The progress of the age has almost outstripped human belief; the future is known only to Omniscience". – Webster.

Technocratic Concept of Progress

- Webster: Shifted his seat in the Senate from New Hampshire to Massachusetts. WHY? Emerging as new seat of manufacturing/industry.
- Railroads (and all technologies) as 'quasi-religious' inevitability.
- Technology as an end in itself. Detaching technological innovation from social/political liberation.
- Technology would lead AUTOMATICALLY to social/political good.
- Technology as a tool to establish political order.
- "Manifest Destiny", "conquest of nature", technologized forces of advancing European-American "civilization"/"higher life", democracy...

Roots of Adversary Culture

Intellectual backlash to the 'Mechanistic Philosophy' of Galileo, Kepler, Newton...

Thoreau, Melville, Wordsworth.

- NOT merely nostalgia or primitivism.
- Webster's vision was seen as dangerously shallow, materialistic and one-sided.
- Machine-in-the-landscape -> Anxiety, dislocation and foreboding. IMPROVED MEANS to UNIMPROVED ENDS.
- Continuing relevance: Antinuclear movements, environmental and feminist movements, the "small is beautiful" and "stable-state" economic theories, quest for "soft energy paths" and "alternative (or appropriate) technologies".

Leo Marx on Technological Determinism

- The unravelling of the technological utopia in the US.
Technological disasters, national traumas.
- Scepticism -> Widespread social pessimism.
- Role of the shift from the enlightenment belief in progress ->
technocratic concept of progress.
- Role of the post-modern turn in strengthening technological
determinism
 - Power was now dynamic and fluid. Flowing through the
system.
 - No central, single, fixed, discernible, controllable locus. This
kind of power is everywhere but nowhere.
 - Difficult to attack, remove, or replace.

“Capillaries”

to be avoided at all costs. The pessimistic tenor of postmodernism follows from this inevitably diminished sense of human agency. If we entertain the vision of a postmodern society dominated by immense, overlapping, quasi-autonomous technological systems, and if the society must somehow integrate the operation of those systems, becoming in the process a meta-system of systems upon whose continuing ability to function our lives depend, then the idea of postmodern technological pessimism makes sense. It is a fatalistic pessimism, an ambivalent tribute to the determinative power of technology. But again, the “technology” in question is so deeply embedded in other aspects of society that it is all but impossible to separate it from them. Under the circumstances, it might be well to acknowledge how consoling it is to attribute our pessimism to the workings of so elusive an agent of change.

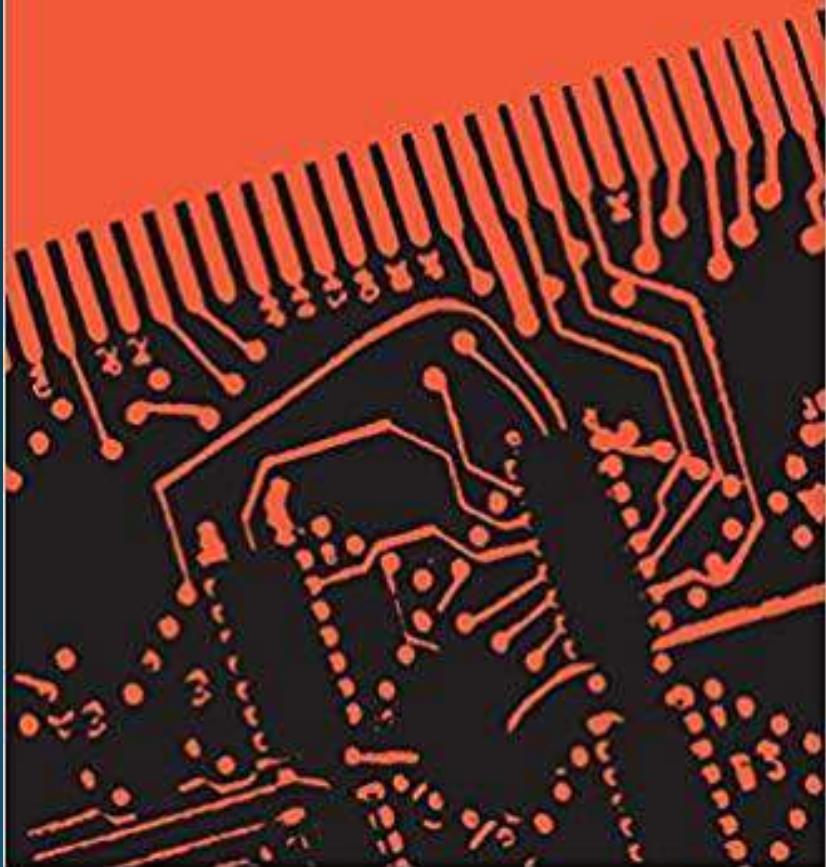
Lecture 15:

The *Politics* of Technology

Course: Science, Technology and Society Studies

Autonomous Technology
Technics-out-of-Control
as a Theme in Political Thought

Langdon Winner



What is the 'Politics' of Technology?

"Are the various paths of technological development freely and deliberately chosen, or are they instead the product of determinism, necessity, drift, or some other historical mechanism?"

Factors to consider:

- Role of individuals (James Watt, Du Ponts, Thomas Watson)
- Role of political circumstances (colonialism, political upheavals, individual interests)

Real question is: How far do technologies go in imposing LIMITS on human agency? How 'real' is 'choice'?

Master and Slave revisited

Technology and the “*Faustian Bargain*”:
Paying the price of the loss of freedom

“*This is how things work*”: A new kind of citizenship, which consists in serving one’s own function *well* in the technological order, and NOT meddling with the mechanism.



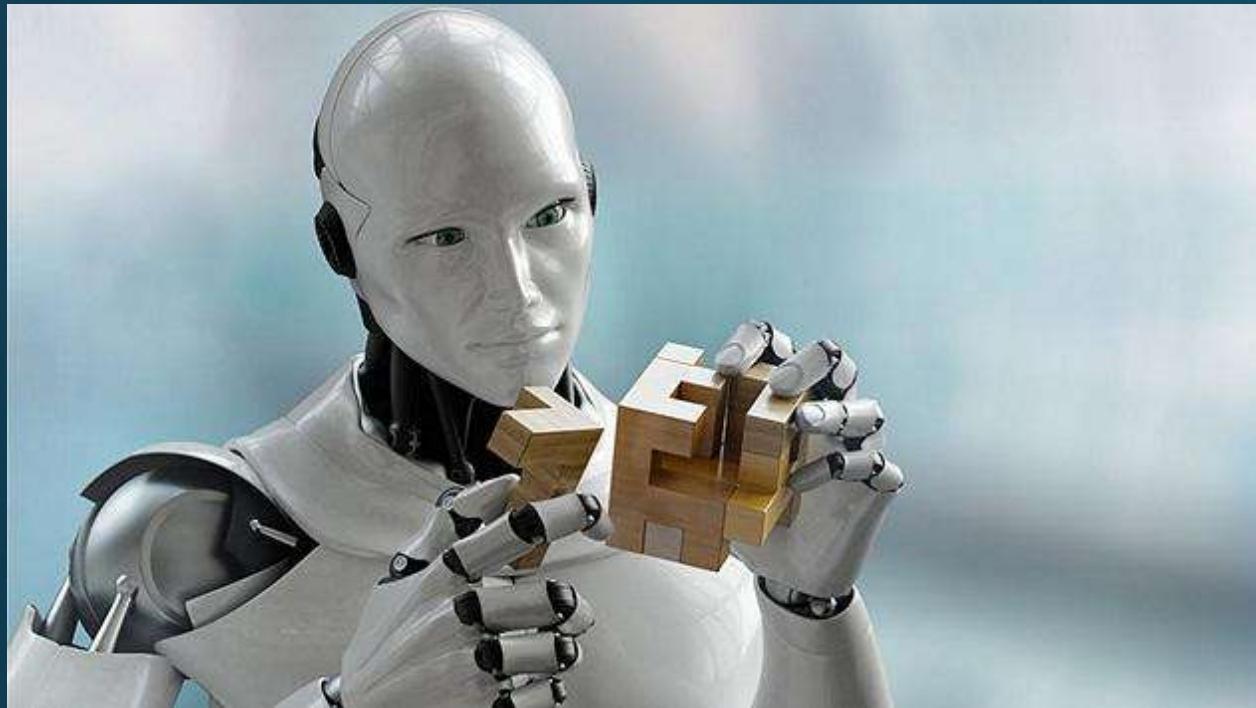
Technological Evolution

Essentially, technology as a temptation that NO person can reasonably be expected to resist, EVEN if it is potentially genocidal.

Applying Darwin's 'evolution' framework to technology

- Reducing human role to a secondary status:
 - Technics evolving, humans as mere *carriers*. Technologies survive even when humans die.
 - Darwin: Individuals die, species survives. So also individual techniques may perish, while the technology itself evolves and survives.
 - 'Natural selection': Darwin said that the biological species most suitably adapted to nature, survives. Now, INVERSION happens. Technologies, most suited to the 'selective environment' provided by human beings, survive. Humans do not actively participate.

Humans as CATALYSTS.



*"The Tool we have invented is our
successor"* –

Arthur Clark



Technological Evolution

Flaw in the argument:

- Discovery (that humans are secondary) is the initial assumption.

Categories of analysis do not include a role for free, conscious human agents. EXAMPLE: Ellul.

“When a given technical discovery occurs, it has followed almost of necessity certain other discoveries. Human intervention, in this succession appears only as an incidental cause, and no one man can do this by himself”.

Technology as self-determining: Human motives, decisions, creative insights and acts are placed at its service. Not an area where prudence, scruples reign.

So is there no human influence on social/political or economic mechanisms?

Technological Evolution

Weaknesses apart, it is possible to look for “elements of dynamism, necessity, and ineluctability built into the *origins* of the [technological] process?

Three conditions leading to technological dynamism:

- a) Universal willingness of people to seek and employ technology
- b) Existence of organized social systems in all technical fields
- c) Existence of technical forms upon which new combinations and modifications are based.

Role of culture: To provide a certain *specificity* to technological innovation.

EXAMPLE of evolution: Otto Hahn’s dilemma.

Should Otto Hahn, Heisenberg, Wirtz, feel ‘guilty’?

Heisenberg says NO: They are all merely links in an inevitable causal chain of technological development.

“If we don’t do it, someone else will”.

Technological Determinism

What is 'technology'? Various elements:

- Apparatus: Structure of material parts so assembled so as to produce determinate, predictable results.
- Technique: Structure of human behaviour/knowledge/practice designed to accomplish a definite outcome.

Technical Organisation = Apparatus + Technique. Human beings and apparatus in STRUCTURED relationships.

Technology imposes ORDER, FORM. Induces conditions, decides roles/what we do, calls for "adaptive responses".

EXAMPLES: Marx – "*The handmill gives you society with the feudal lord; the steam mill with the industrial capitalist...a change in man's productive forces necessarily begins a change in their relations of production*" (page 79 of AT). Humans are NOT FREE to choose their productive forces.

Technological Drift

Unforeseen or unanticipated effects of technology.

Implications: Failure of the “competing interests” political theory.
Voicing interests becomes null and void because effects have *already* taken hold and a class of ‘losers’ have been created.

Proposed cures:

- Empiricism
- Due Diligence

Weaknesses in the above. So?

- Identify INTENTIONALITY
- Identify USE(S)
- Identify MORAL CONSEQUENCES

PROGRESS as the best example of commitment to drift, to accumulated, unanticipated consequences.

Technological Imperative

Technologies require other technologies for their successful functioning.

One requires not just MEANS, but the entire set of MEANS to the MEANS.

Once ONE choice is made, action MUST continue until the whole system of means has reached its proper alignment. Anything else is irrational, insane, malice, stupidity, madness.

EXAMPLE: Electrical gadgets.

Walt Rostow's modernisation theory.

WHAT Governs?

WHO governs is important, but WHAT Governs is equally important.

Winner: Certain NOTIONS are crucial, if we are to answer this question.



THE AGE OF SURVEILLANCE CAPITALISM

THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER

SHOSHANA ZUBOFF

Important Concepts

- Artificiality: Reconstruction of nature -> Rebuilding (based on preconceived designs) of human society, of “traditional”, ‘natural’ social groups.
Consequences? Human beings are now largely responsible for worldly conditions. Modern systems are not self-maintaining, self-controlled.
- Extension: Extension of the ‘natural’ senses (seeing, smelling etc.) -> Augmenting capacity to see/hear etc -> Becoming a NEW being -> Remoteness.
- Rationality: Parts fit together correctly. Steps in the process follow each other in an appropriate, preconceived fashion. Rationality is formalised, programmed into the design.
 - Disenchantment, intellectualisation
 - Accommodation of means to ends
 - Kind of ‘efficiency’. Quest for universal efficiency

Important Concepts

- Size and Concentration: Impetus to large-size, large-scale NETWORKS. Economies of scale (water systems, motel chains etc.)
Operating principle: Enlarge, concentrate, connect.
- Division: The Baconian doctrine. "*Mechanising production means dissecting work into component operations – a fact that has not changed since Adam Smith ...in 1776*".
- Complex Interconnections: Precise division is followed by intricate reconnection.
Artificial-rational systems need continued attention, rebuilding, repair AND eternal vigilance [the price of artificial complexity].
- Dependence and interdependence: There is interdependency, wherein each parts is connected to, dependent on the other. BUT, should not overread the relationship. A truly interdependent system would be non-hierarchical or classless.

"Large man-machine networks require hierarchical structure as an operating condition"

Important Concepts

- The Centre: Processes require directions from a core.
Functioning/work depends on the core.

Power is removed from geographical localities, from neighbourhoods, local communities and given over to a single agency of control.

Local direction is seen as a source of WASTE, CHAOS and worse.

- Apraxia: “Inability to perform coordinated movements”. One link ceases to function, whole system stops is thrown into chaos.

Threat of technological Apraxia? Forces planners and administrators to do anything to avoid.

“To describe the technological system, is to describe the true system of governance under which men live”.

Men do not “use” technology arbitrarily, but they follow operating procedures and techniques.

Important Concepts

Relationship between APPARATUS, TECHNIQUE and SOCIAL ORGANISATION

"In terms of their own internal structure, most of them require precise coordination of the three major elements in our earlier definition. Apparatus almost always requires refined technique: an elaborate, knowledgeable kind of human practice to guarantee its successful working. In the great majority of cases, however, both apparatus and technique require the presence of well-developed, rational, social organization. The world of craftsmanship – the world of technique plus apparatus alone-has vanished. Apparatus, technique, and organization are interdependent, that is, reciprocally necessary for each other's successful operation"

DISCUSS: Artisan versus Industrial worker.
Communal Baths versus Modern Bathroom.
Sourbread versus factory-manufactured bread.

Important Concepts: Reverse Adaptation

Reverse Adaption

“...technical systems, once built and operating, do not respond positively to human guidance. The goals, purposes, needs, and decisions that are supposed to determine what technologies do are in important instances no longer the true source of their direction. Technical systems become severed from the ends originally set for them and, in effect, reprogram themselves and their environments to suit the special conditions of their own operation. The artificial slave gradually subverts the rule of its master”

Important Concepts: Reverse Adaptation

Reverse Adaption

“... reverse adaptation – the adjustment of human ends to match the character of the available means. We have already seen arguments to the effect that persons adapt themselves to the order, discipline, and pace of the organizations in which they work. But even more significant is the state of affairs in which people come to accept the norms and standards of technical processes as central to their lives as a whole. A subtle but comprehensive alteration takes place in the form and substance of their thinking and motivation. Efficiency, speed, precise measurement, rationality, productivity, and technical improvement become ends in themselves applied obsessively to areas of life in which they would previously have been rejected as inappropriate”

RESULT: *“(1) the process of articulating and criticizing the matter of ends slips into oblivion, and (2) the business of discovering effective means and the ways of judging these means in their performance assumes a paramount importance”*

Why not use ENDS as “inputs” in the design process, and tailor them to BE the system’s own needs?

EXAMPLE: Space exploration.

Technology ceases to depend on class, professional or personal interests.

Decision-making BEYOND the role of any kind of elite (technical, scientific, political, administrative)

ment. Thus, selections as to *what* is to be done and *how* proceed almost as if by clockwork. Once such conditions take effect, only an extraordinary act of will can reopen the process of evaluation, choice, and action, for all situations in social life turn out to be those in which a known instrument is available to do the job and a corresponding instrument ready to make the right selection. Ellul writes:

tions developed over many decades.¹¹⁹ Nowhere does the present theory deny the presence of such economic forces. It merely suggests that such factors may not be the overwhelmingly decisive ones. There is a sphere of vital concern that one misses if every question is quickly reduced to categories of economics.

The Revolution and Its Tools

Goals of the “Technological Maintenance” state:

- High levels of employment
- High growth rate
- Increasing supply of desired goods and services
- Higher standard of living
- + Strong military defence

Goals of a Revolutionary state:

- Abolition of the class structure of society
- Institution of worker participation and control in the economy and state
- Construction of communist society, end of class domination, exploitation and division of labour

Are the goals COMPATIBLE?

The Paradox in Lenin's thought

Lenin:

- Denies the authority of all pre-revolutionary political authority
- Defends residual authority carried over from the capitalist world (the legitimacy/primacy of technique, and of the leadership of technically proficient persons).
- Calls for universal equality and political participation without subordinate roles
- Technology requires subordination, hierarchy, obedience

“Authority” and “Autonomy” are NOT absolute.

The Paradox in Lenin's thought

Is the search for efficiency and productivity in keeping with ideals of workers' control and participation?

One set of goals thrives on highly rationalised, authoritarian technics!

What if workers' demands and decisions point in the direction of a less efficient, rational and productive industrial system?

The USSR experience.

Can we speculate about a technology that "*allows for division of labour to be a thing of the past, a technology that would not breed social stratification, hierarchy, inequalities, privilege*"?

- Bridge
- An assembly machine
- Automobile
- TV
- Space program

WHY are new technologies introduced?

“the increased deployment of nuclear power facilities must lead society toward authoritarianism” - Denis Hayes

“... the biggest and best that science and industry made available were the best guarantees of democracy, freedom, and social justice”

Factory system, Automobiles, Telephones, Fertilizers, Radio, TV, Space Program, Nuclear Power – described as “democratizing, liberating forces”.

Society and Technology

Lewis Mumford: TWO technologies existing side by side

- AUTHORITARIAN: System-centred, powerful, inherently unstable
- DEMOCRATIC: Man-centred, relatively weak, resourceful and durable

POLITICS and TECHNOLOGY: Is the NATURE and HARDWARE of technology authoritarian OR democratic?

Understanding the relationship:

- FIRST: Invention, design, arrangement of a technical device becomes a way of settling an issue in a community.
- SECOND: Inherently political technologies that REQUIRE (or are compatible with) a kind of political relationship.

- Langdon Winner



Technical Arrangements as 'Forms of Order'

- 1920s-1970s: Robert Moses built 200 overpasses on Long Island, New York. Jones Beach

FEATURES: Low-hanging, designed so that buses/trucks could not pass.

- 1880s: Cyrus McCormick's pneumatic molding machine in a reaper manufacturing plant

FEATURES: required unskilled labour, produced inferior castings at higher cost.

Technical engineering → Social Engineering?

"What we mostly view as innocuous, "pre-political" objects such as buildings, roads or industrial machines, in fact contain and exercise a form of power...they are WAYS of building ORDER in the world, not just neutral tools seeking efficiency"



Technical Arrangements as 'Forms of Order'

Should we study ONLY uses of technologies?
INTENDED versus UNINTENDED consequences?

Not just use, but DESIGNS and ARRANGEMENTS are important.
Technologies can be DESIGNED to favour some interests.
EXAMPLE: Tomato harvester
Transforming type of tomatoes, harvesting AND ownership patterns.
US: No. of tomato farmers reduced from 4000 in early 1960s to 600 in 1973.
Harvester as an EMBODIMENT of an order that rewards some and punishes others.

Scientific knowledge, technological invention, corporate profit REINFORCE each other.

Inherently Political Technologies

INTERNAL versus EXTERNAL factors: Are a pattern of social relations the result of UNAVOIDABLE properties of technologies, or are they imposed independently by a governing body/ruling class/social institution?

- Inherent authoritarianism in the factory system. Enforced coordination, discipline and timing.
A technical system REQUIRES the creation and maintenance of certain social relations/conditions as the OPERATING environment/ SYSTEM.

"If you accept nuclear power plants, you also accept a techno-scientific-industrial-military elite. Without these people in charge, you could not have nuclear power"...

- STRONG compatibility with a certain kind of social and political relationship.

DISCUSS: Solar energy *versus* coal/nuclear energy

Technology and its Social/Economic Determinants

What technology REVEALS:

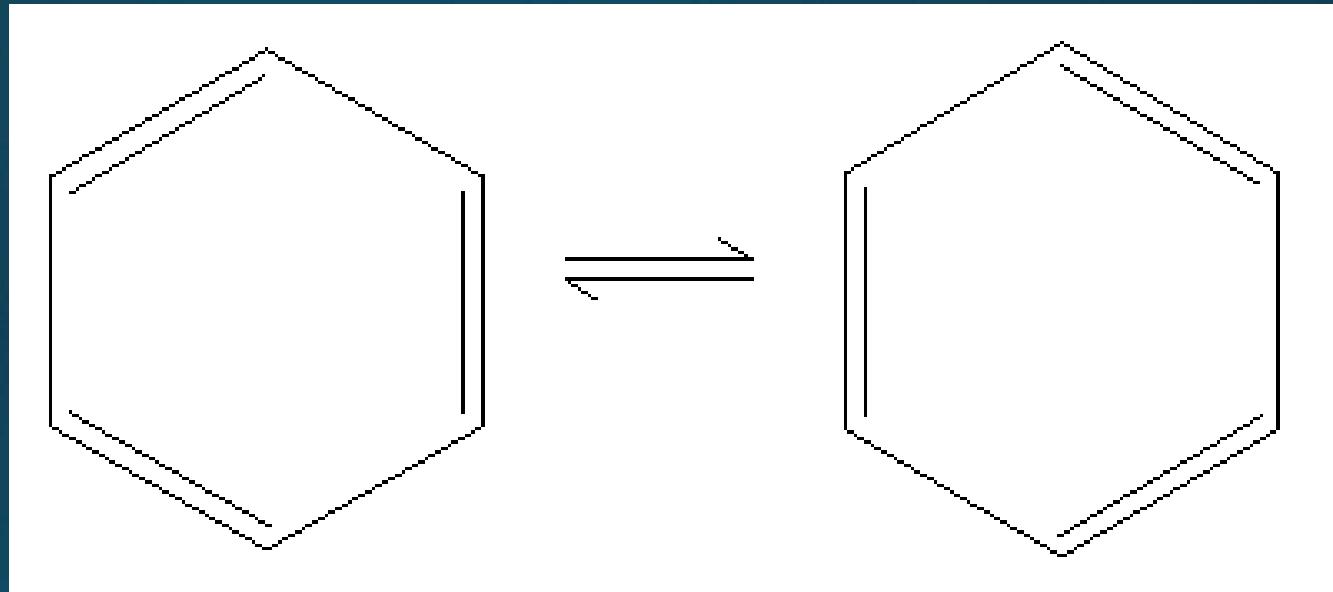
"Technology is the means through which man's mode of dealing with Nature, as well as the mode of formation of his social relations and of the mental conceptions that flow from them is disclosed. Instruments of labour indicate social conditions under which the labour is carried on; it is not the articles made, but how they are made, and by what instruments, that help to distinguish different economical epochs"

- Karl Marx, *Capital*

What Technology Reveals

A case AGAINST
determinisms:

“Technologies
and
organizational
forms *internalize*
a certain
relation to
nature as well as
to mental
conceptions and
social relations,
daily life and
modes of
production” –
David Harvey



“assemblage of moments, coevolving
in a dialectical manner”

What Technology Reveals

"A detailed study of daily life under capitalism will, for example, 'reveal' a great deal about our relation to nature, technologies, social relations, mental conceptions and the labour processes of production. Similarly, the study of our contemporary relation to nature cannot go very far without examining the nature of our social relations, our production systems, our mental conceptions of the world, the technologies deployed and how daily life is conducted. All these elements constitute a totality, and we have to understand how the mutual interactions between them work"

– David Harvey

Marx focusses on processes rather than on things per se.

What Technology Reveals

"If technology internalizes social relations, mental conceptions and ways of producing, what are those distinctive technologies, appropriate to a socialist or communist mode of production? If you take technologies of capitalist mode of production and try to construct socialism with them...you are likely to get another version of capitalism, which is what tended to happen in the Soviet Union with the spread of Fordist techniques"

– David Harvey

What Technology Reveals

Nathan Rosenberg:

- Marx refuted technological determinism
- Marx held *social* and *economic* factors responsible for initiating thoroughgoing change in Europe in the eighteenth century.
- Tumultuous changes in human society occur when the “control over the tool” is transferred out of human hands.

One needs to be aware of the history of technology, its emergent forms, and moreover of its intricate and organic connections with social relations and economic determinants.

Refer: Nathan Rosenberg, ‘Marx as a Student of Technology’, *Inside the Black Box: Technology and Economics* (Cambridge: Cambridge University Press, 1982).

Lecture 20:

STS and the Digital World

Course: Science, Technology and Society Studies

ZAPATISTAS IN CYBERSPACE

A GUIDE TO ANALYSIS & RESOURCES

Online Activism

Use of INTERNET by ACTIVISTS

- Late 1990s: Anti-WTO protestors in Seattle
- 2001: Anti-war protests against US/UK military action in Iraq
- Against a Costa Rican 'Free Trade' agreement with the US
- Supporting the Zapatista movement in Mexico

CONTEXT in India:

- Existence of MASTER FRAME guiding social movements (i.e. poverty alleviation, ending inequality and injustice) till 1970s
- Shape shifting of activism (emergence of new social movements, right-wing movements)
- Long history of movements opposing technology

In popular discourse, Technology was AGAINST Social Movements

- Emergence of Neo-liberalism ALONG with IT

Online Activism in India

Use of INTERNET by ACTIVISTS in India

CHEQUERED history:

- STATE SUPPRESSION: Ravi Srinivasan, Free Speech and Twitter
- Driving public FURY:
 - 2012 anti-rape protests in Delhi
 - Tarun Tejpal incident
 - Article 377 and the internet
- Official/Unofficial political tool:
 - BJP's 2014 Internet campaign
 - 2013 Muzaffarnagar riots
 - India Against Corruption campaign

Pink Chaddi campaign in India, Net Neutrality movement, Kashmir??

AMPLIFYING everything, from anger about injustice, armchair activism, communal hatred, to misogyny

Online Activism

QUESTIONS while studying internet, technology and activism:

- Who are the ACTORS?
- What is their RELATIONSHIP with offline activists?
- What are the ISSUES, and what is the master narrative of these issues?
- Where does it locate PROBLEMS, and what are the SOLUTIONS?
- What is its understanding of technology/development and social change?
- What are its METHODS, STRATEGIES, ways of ORGANISING?
- What is the role of individuals, organizations, networks, collectives?

MAIN QUESTION: Is the INTERNET truly DEMOCRATIC?

Internet, Social Media and Governance

QUESTION: Have internet and social media made governance and policy-making more OPEN, CONSULTATIVE and INCLUSIVE?

- Social Media and the POWER of influencing and communicating . Power of influencing beliefs is a crucial POLITICAL tool.
- Social Media and the potential to enhance 'deliberative' democracy.

DELIBERATIVE democracy is public deliberation of free and equal citizens, feeding into political decision-making/self-governance.

- Social Media and the potential to INCREASE 'social capital': access to resources/information/networks/relationships.
- Internet/social media CAN provide for a 'public space'. NOT necessarily a 'public sphere'.

PUBLIC SPACE: a forum for public deliberation.

PUBLIC SPHERE: a *democratic political culture* where people can, outside the state's supervision, have critical debates and can reason freely. NO disturbance from political and social power.

Internet, Social Media and Governance

Case Study: The RTI movement

- Began in the 1990s in Rajasthan, on behalf of farmers and workers. Spearheaded by the *Mazdoor Kisan Shakti Sangathan* (MKSS)
- Formation of the National Campaign for People's Right to Information (NCPRI) – consisting of journalists, activists, academics, civil servants, lawyers.
- RTI was the result of long deliberations between 1996-2005 (between the government, parliament, civil society organizations, NCPRI). Several rounds of talks/deliberations.
- International backdrop: Increasing global mood for transparency in state-citizen relationships, for RTI and a democratic law-making process.
- Mobilizations remained CONFINED to workshops, conventions, seminars in Universities and research institutions.

USE of internet/technology: Mass emails (even that was limited)

Internet, Social Media and Governance

Case Study: The India Against Corruption (IAC) movement

- Organizing body: IAC, led by activists (Anna Hazare), civil servants, 'civil society', people from various backgrounds (law, public administration, academia)
- Strategies: Extensive use of internet/social media as well as traditional media to share information and mobilize.
- MAIN strategy: Maintain mobilization, NOT to reach a consensus on policy.
- Existence of a dedicated team of IT experts maintaining IAC's website and 14 city-centred websites round-the-clock.
- Extensive use of Facebook, Twitter and WhatsApp.
- GOAL ATTAINMENT: In first 4 days, IAC had 116,000 fans on FB. Many FB pages formed. Anti-corruption law extensively discussed.
- Total online support: 1.5 million

Internet, Social Media and Governance

Case Study: The India Against Corruption (IAC) movement

- Movement HARDLY progressed from mobilization.
- Little public participation in drafting process (apart from initially, where opinions were collected and incorporated) .

UNLIKE in the RTI movement, consistent public discussions, deliberations, involvement in decision-making was LOW. Especially during discussions with 'experts'.

- IMPACT of vast amount of online discussions? Difficult to analyze.

QUESTIONS: What was the EFFICACY and QUALITY of these discussions?

Need to use discourse analysis/extensive data mining

Internet, Social Media and Governance

Case Study: The NET NEUTRALITY (NN) movement

- TRIGGER: Department of Telecom put out a document inviting comments. 177-page paper released by the TRAI.
- PURPOSE: To oppose differential treatment of internet content.
- Organizing body: No single organization, though there were some activist groups (netneutrality.in, savetheinternet.in)
- Impact: Created awareness (through websites and social media platforms) of net neutrality, encouraged people to actively participate in the debate.

Massive public outrage, government forced to withdraw proposal.

1.5 lakh emails over JUST a WEEKEND. 10 emails/minute.

Internet, Social Media and Governance

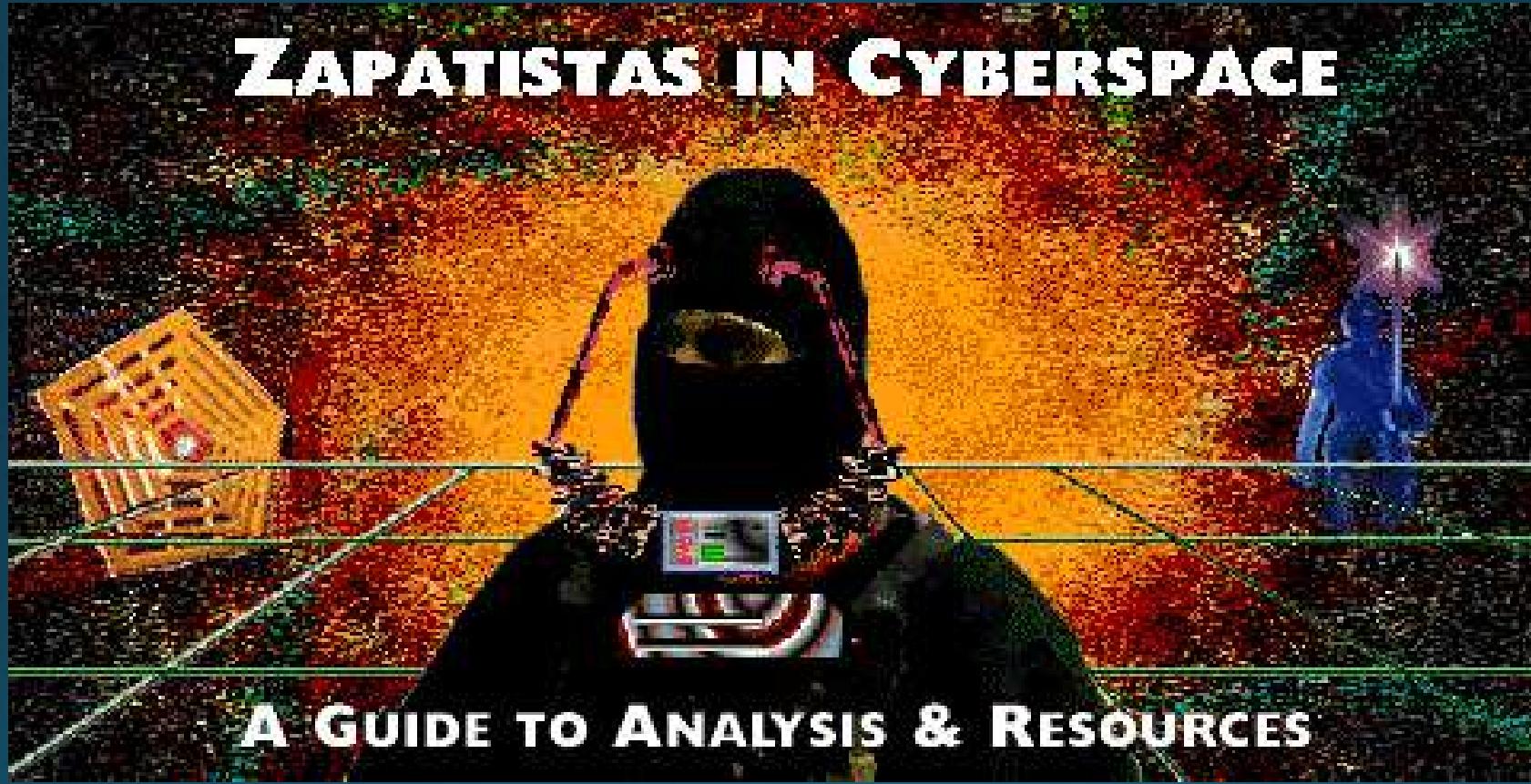
What do these case studies tell us?

- Difference in the level of internet/social media involvement.
- IAC: Extensive use of social media could have hindered the process of consensus formation. Massive media glare.
- NN: Mobilization of average citizen (typically middle class, educated citizen). Involvement of industry bodies (FB's Free Basics services).

POWER of mass feedback in framing policies. STRUCTURED METHODS for deliberations and feedback.

BUT, high involvement during very SHORT period. Followed by LULL.

- Use of social media can undermine complexities, raising expectations for instant responses.
 - Can REDUCE the quality of the consultation process.
 - Can overwhelm authorities through excessive feedback
 - Difficulty of separating STRATEGIC and TECHNICAL aspects of decision-making



ZAPATISTAS IN CYBERSPACE

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Online Activism

POSSIBILITIES and LIMITATIONS of Internet as a tool in social movements:

- Internet as an INTERMEDIATE space: Connecting movements and possible sympathizers/opponents

TRANSCENDS boundaries, forges NEW connections between events and places

- Internet opens the potential for restricting movements to a contained 'space' and 'scale'.

EXAMPLE: The Chiapas uprising in South Mexico in 1994.
Internet/'Hi-tech' medium brought to the aid of indigenous, poor peasants who were not even aware of the internet.

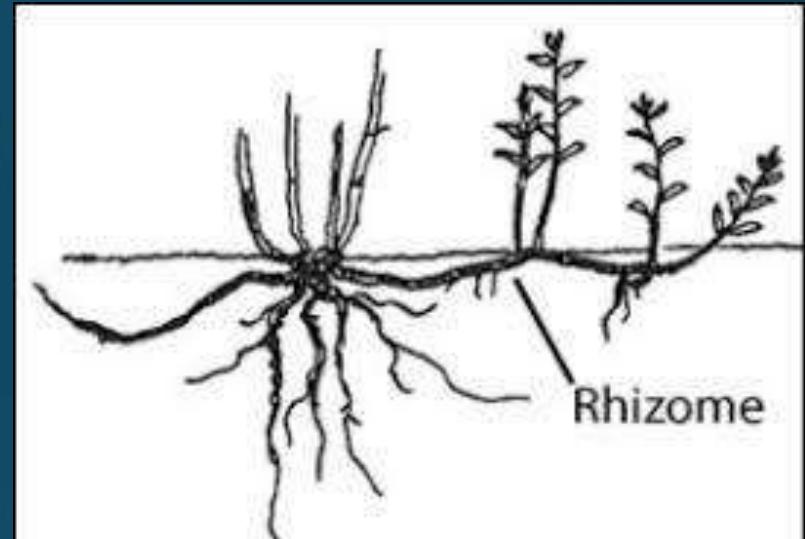
QUESTION: What is the RELATIONSHIP between CYBERSPACE and SOCIAL spaces? What is the nature of information exchange?

Rhizomes of Cyberspace

STRUCTURE of the Internet:

- Connection among computers/servers that communicate to each other through standardized protocols
- No central facility which organizes the communication
- Theoretically, it is a 'NUETRAL' space, an electronic community where gender, nationality, class, ethnicity, caste DO NOT matter

SOUNDS IDEAL?!



"a continuously growing horizontal underground stem which puts out lateral shoots and adventitious roots at intervals"

Rhizomes of Cyberspace

STRUCTURE of the Internet:

- The class divide
- The Urban/Rural divide , the First World/Third World divide
- Its bias towards 'masculine', white and English discourse
- Information overload

CYBERSPACE and the social world

- Cyberspace reflects all the power relations in the real world
- Cyberspace is a site of struggle, NOT a straightforward tool of 'liberation' OR domination
- Cyberspace is like a rhizome – growing in all directions, with no definite beginning or end. Like MOLECULAR flows: fluid, disseminating and non-hierarchical.
- The State is MOLAR, which reduces complex (socializing OR antagonistic) relationships into dual opposition.

The Chiapas/Zapatista struggle in Mexico

Use of the internet:

- Used by academics to provide information about the conflict and background about the Zapatistas
Internet NOT used by the Zapatistas themselves. They had NO portable laptops/modems.
- A structure developed: e-mail servers, bulletin boards, along with write-in and fax campaigns
- Involvement of Central American solidarity groups, and anti-NAFTA organizations
- The cyber-Zapatistas took the campaign BEYOND south Mexico, but DID NOT enter into debates on strategy
- The 'molecular', rhizome-like movement of information made it difficult for the Mexican government to launch a quick, quiet military attack on the Zapatistas

The Chiapas/Zapatista struggle in Mexico

Use of the internet and ENLARGING the terrain of struggle

- News sneaked out through an uncontrollable, efficient channel. NOT controlled by the Zapatistas. Therefore, NOT a Netwar between two static forces.

MULTIPRONGED. *Intercontinental Network of Alternative Communication.*

- Merging of several strands of protests: No fixed manifesto for a long time.

Women's rights, anti-NAFTA sentiments, indigenous rights.

Involved churches, human rights groups, leftist groups.

- Internet enhanced the reach of traditional media covering the Zapatista struggle.
- REVERSE panopticon: Many people watching the Zapatista movement and the government's response.
- MULTIPLE cyber AND physical interactions, aiding each other. i.e. Peace and aid caravans. Two Zapatista conferences.

The Free Radio Movement

Communication and Social Movements

PROBLEM: Media-Movement Relations.

- Media can aid OR deter the movement
- Can provide opportunity for the demands/discourse of the movement to enter the mainstream discourse
- Movements can force coverage by 'performing' for the media (e.g. TN farmers' movement in Delhi)
- Movements can shift frames depending on the media, and media in turn can portray frames in a specific manner
- Media can change relationships /dynamics within social movements (e.g. Chiapas struggle)
- Media coverage can constrain repressive capacity of the State

The Free Radio Movement

Communication and Social Movements

MOST OFTEN, movements struggle to get positive coverage and careful representation of their demands (e.g. Page 3)

- Movements can CIRCUMVENT mainstream media by using alternative media.
- Movements can 'reform' the media, changing rules and structures that govern movement-media relationships.

Free Radio movement: COMBINATION of the two strategies.

MOTIVATION:

- Regulation of the US telecom industry, allowing individuals to own any number of radio stations.
- BUT, de-facto ban on low-power radio, COMBINED with increasing concentration in ownership in radio.
- Citizens felt there was little DIVERSITY in the radio space; illegally set up tiny radio stations into unused bandwidths.

The Free Radio Movement

STRATEGIES:

- To challenge “exclusionary” and “unduly strict” ownership and licensing regulations.
i.e. Free Radio Berkeley
- Electronic “civil disobedience”: Illegal broadcasts . Estimated 1000 illegal stations across the US in the late 1990s.

PARTICIPANTS:

- Demographically and political diverse. Anarchists, religious conservatives, Spanish-speaking migrant farm workers, squatters in New York City.

Set up nation-wide organizations, held conferences, established websites and email-servers (e.g. <http://www.radio4all.org>)

The Free Radio Movement

- RECEPTION? Spread through informal networks, very few stations advertised themselves. Thus, little evidence available.
- ALTERNATIVE to mainstream media?
 - Different organizational STRUCTURE. Collective decision-making process, based on consensus, varying degree of decentralization and hierarchy (e.g. Zee News/Times Now and JNU coverage)
 - Difference in CONTENT. News, information, music, was different (i.e. public health, coverage of local social movements). Often emerged out of existing movements.
 - Emphasis on
 - Local culture and issues
 - Diversity
 - Depth and breadth of public debate

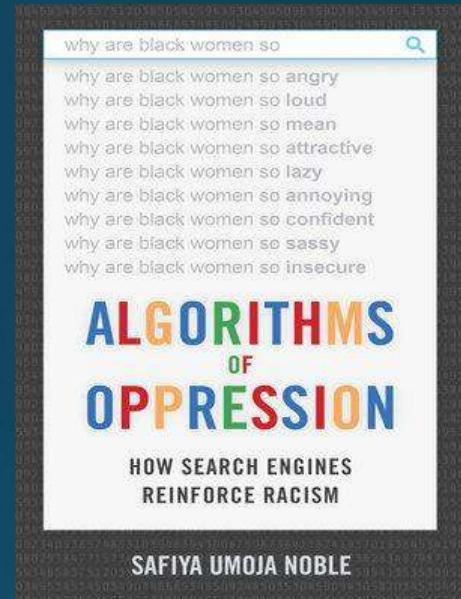
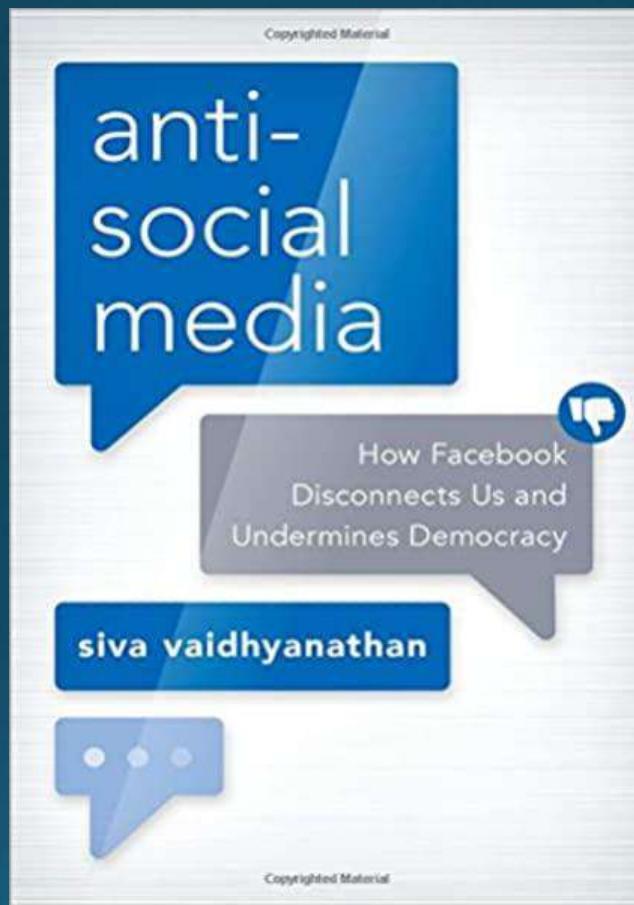
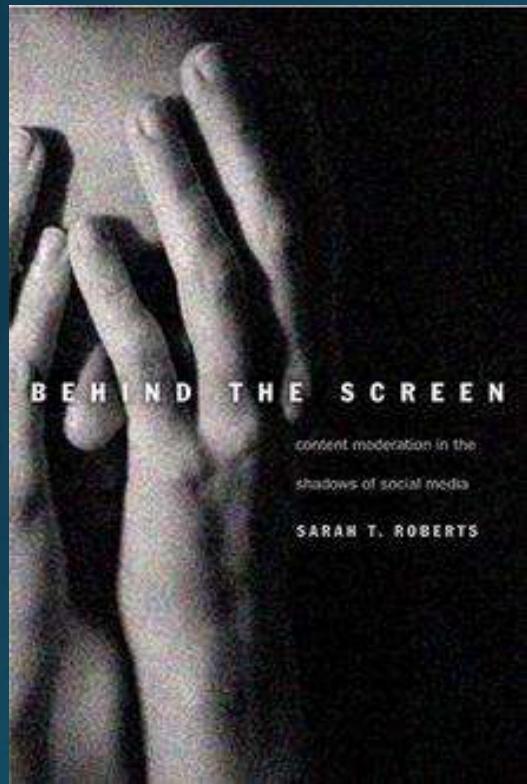
The Free Radio Movement

- Long-term impact?
 - Some stations fought for and won change in regulations. Became legal.

OLD Regulations: Stations should construct and operate a station for three months WITHOUT advertising or other revenue. Excluded the poor.

with NEW regulations: 675 new, legal stations. E.g. Coalition of Immokalee Workers (migrant farm workers)

- Government's crackdown and confiscating equipment (transistors) killed several stations.
- ❑ POTENTIAL for shifting power balances, reducing inequalities between actors in a conflict
 - ❑ Lowering of elite control over media and information
 - ❑ Providing opportunity for social movements to convey their message

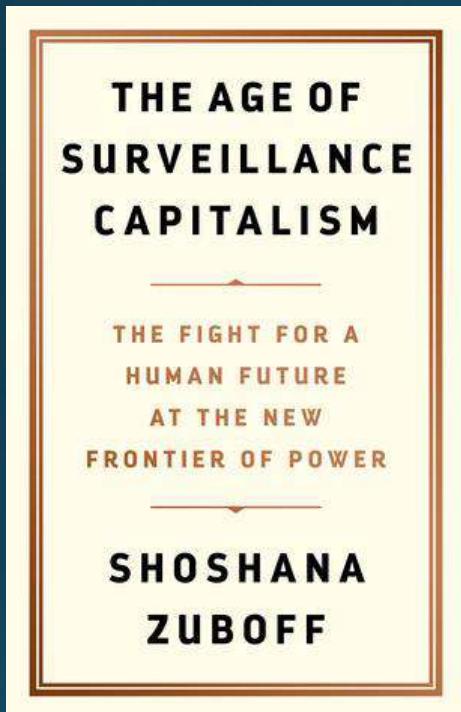


Computational Technologies

- Tinder
- Aadhar
- AI-based services
- Issues of Surveillance/Misinformation/Fake news
 - On WhatsApp
 - On Facebook
 - On Reddit
 - On Twitter

QUESTION: Can we actually take back big-data analytics from the government and from tech corporations?

Consumer, Product, or Raw Material?



“Demanding privacy from surveillance capitalists or lobbying for an end to commercial surveillance is like asking...a giraffe to shorten its neck”

WHY?

- Human experience is raw material. NECESSARY for production [of predictive models].
- Generating “behavioural surplus” [or not] is NOT an option available to companies.

Surveillance Capitalism

When, where and in what circumstances does this new regime of surveillance capitalism begin?

Launch of Apple's iTunes platform in 2011.

- The individual becomes the central actor in the market. The individual's desire to be uniquely catered to as a customer, to exercise control over one's life, is a pivotal moment.
- What makes this possible? New digital, networked spaces. Individual mentalities and demands now had to be identified and addressed in this new modernity summoned by the internet and powered by the new information infrastructure and technologies.
- Silicon Valley's notion of "permissionless innovation": Unilateral seizure of rights over data *without consent* in order to cater to these new needs. Apple, Google, Amazon, FB....
- Google: True pioneer of surveillance capitalism. Google sets in place an elaborate model of computer-mediated transactions, where the aim is continuous data extraction, behavior prediction, personalization and customization. Personal experience and data is now fully converted into a rich node to be mined by corporations.

Surveillance Capitalism

- Surveillance capitalism poses a *specific* challenge because of its tumultuous impact on the *very concepts* of consent and privacy.
- What is surveillance capitalism? While surveillance capitalism is not technology, new computing tools such as machine learning are necessary for surveillance capitalism to exist.
- It is a new economic order that uses all human experience as raw material. This raw material is extracted in multiple ways and forms through technological means; it is used to predict human intentions, to produce and sell goods and services.
- Capacity and potential to modify human behavior in many subtle ways. With this capacity for behavioral modification, it is a threat to human nature itself, just as industrial capitalism was (and is) a threat to the natural world.

“Capitalism’s quest for a new collective order based on absolute certainty has led to a rogue mutation of capitalism”.

This mutation challenges even market democracy and spells a death knell for personal sovereignty.

Behavioral Surplus

- “Behavioral surplus”: Surplus value generated by mining enormous amounts of personal data and converting this behavioral data into a marketable product. The surplus represents that behavioral data available for uses beyond service improvement, and whose only purpose is to ensure exponential profits.
- Requires “digital dispossession” on a widespread scale. Discovery of behavioral surplus led to the development of surveillance capitalism from earlier models of capitalism. Moving from inferring personal behavior -> predicting behavior with increasing accuracy.
- Online -> Offline. Use of smart-home devices, wearables, applications such as Google Maps and Google Earth and self-driving cars. Process of slow habituation.
- Physical movements -> Emotional mapping. Human emotions of sadness, anger, disappointment etc. are harnessed by affective computing, emotion analytics and sentiment analysis. If a particular incursion generates too much of an uproar, companies adapt by promising reforms, or by occasionally paying fines.
- Inexorable expansion. Ambient computing, ubiquitous computing and the Internet of Things (IoT).

Behavioral Surplus

- These computational methods attempt to identify human emotions and sentiments from a variety of sources, including textual and visual sources.
- Ambient computing: just about any type of object imaginable is outfitted with computing ability and connectivity. It allows the use of a computer or internet-enabled device, without human beings consciously using it.
- Ubiquitous computing: Can occur using any device, in any location, and in any format.
- After moving from online to offline monitoring, surveillance capitalism has now entered into a new domain: behavioral control. Not only is data being constantly collected, it is being processed and fed back to trigger certain desired outcomes such as purchase of goods or timely payments of loan installments. Humans as Pavlov's dogs? Punished by the regime of surveillance capitalism for 'undesirable' behaviors and rewarded for 'desirable' ones.

The Discovery of Behavioral Surplus

Surveillance capitalism begins with the discovery of behavioral surplus. More behavioral data are rendered than required for service improvements. This surplus feeds machine intelligence - the new means of production - that fabricates predictions of user behavior. These products are sold to business customers in new behavioral futures markets. The Behavioral Value Reinvestment Cycle is subordinated to this new logic.

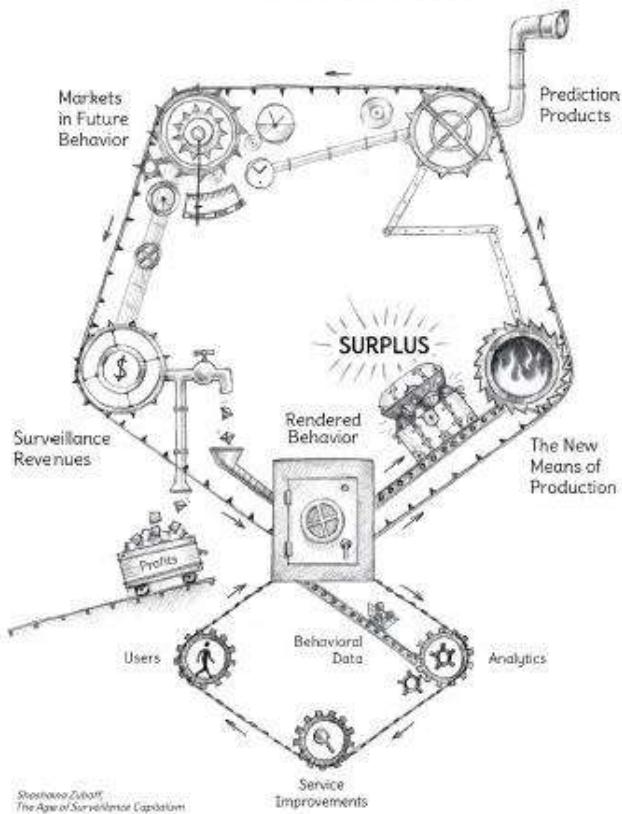
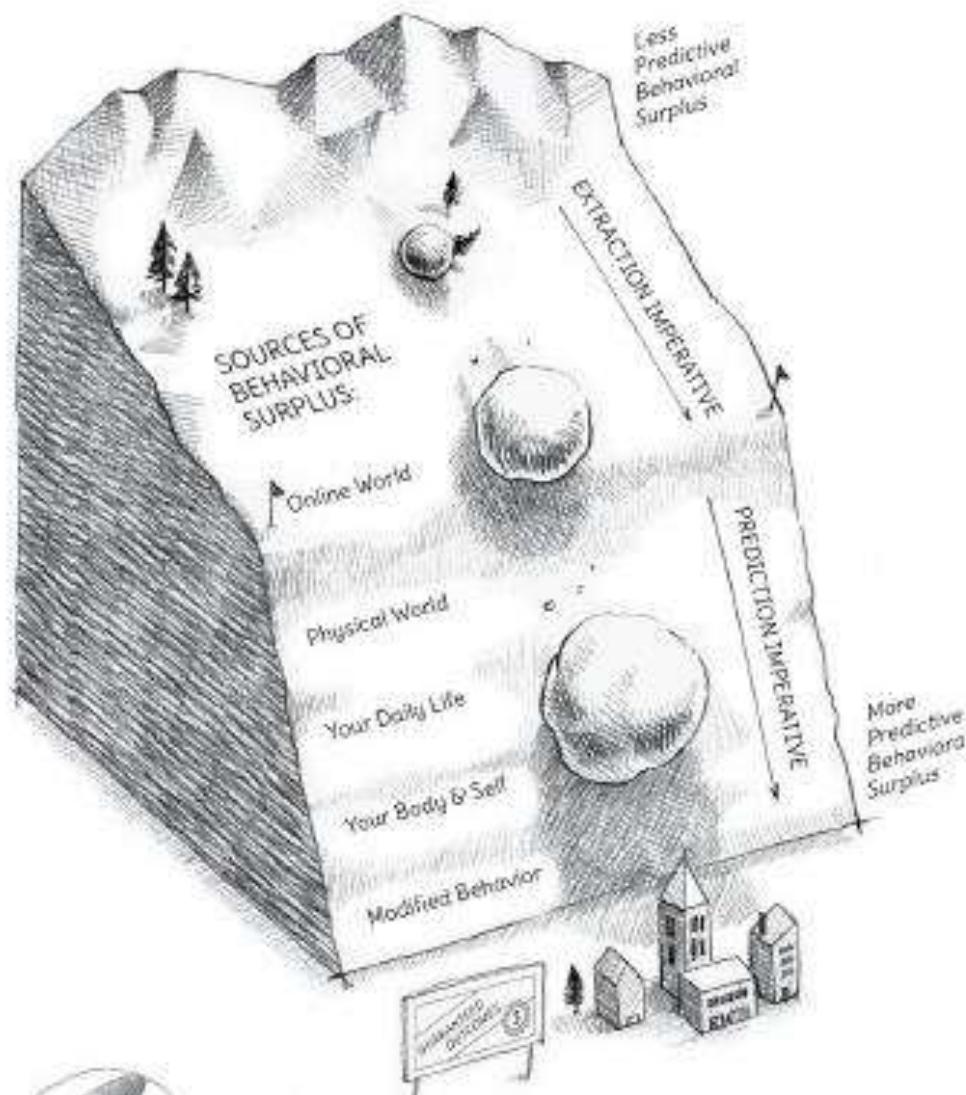


Figure 2: The Discovery of Behavioral Surplus

Sashaova-Zuboff
The Age of Surveillance Capitalism

Surplus Accumulation

outcomes in real-life behavior. Extraction begins online, but the prediction imperative increases the momentum, driving extraction toward new sources in the real world.



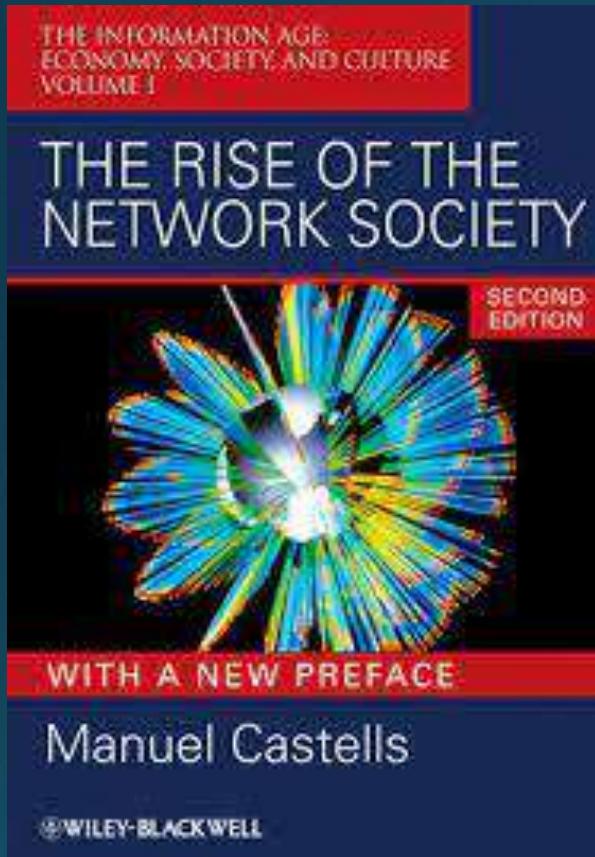
Instrumentarianism

- Instrumentation and instrumentalisation of behavior for the purpose of modification, prediction, monetization and control.
- Parallels between instrumentarianism and totalitarianism: While the latter is an explicitly political project that converged with economics to overwhelm society, the former is a market project that converges with the digital to impose its own form of social control and domination. Just as othering is a crucial element of the totalitarian project, Zuboff argues that instrumentarianism functions by othering human experience and all notions of freedom. In other words, an autonomous, unpredictable, unknowable human being is the new 'other'.

Question: WHAT has Zuboff identified as the “raw material” or MEANS of PRODUCTION in Surveillance Capitalism? Can we use Winner and Harvey to take forward this analysis?

Network Society

- A society whose social structure is made of networks powered by microelectronics-based information and communication technologies.
- Social structure: Organizational arrangements of humans in relations of production, consumption, reproduction, experience, and power expressed in meaningful communication coded by culture.



Network Society

- Transformation in communication leads to a new kind of globalization and a new kind of society.
- There have ALWAYS been social networks. What distinguishes network society is the use of ICTs to create and sustain far-flung networks in which new social relationships are created.
- Networks are self-reconfigurable, complex structures of communication that ensure unity of purpose and flexibility of its execution by the capacity to adapt to the operating environment.
- Networks are not new. Old, flexible networks were replaced by vertical, hierarchical, bureaucratic networks of the industrial age (both statist and capitalist versions).
- Beyond a certain threshold of size, complexity, and volume of exchange, they become less efficient than vertically organized command and control structures, *under the conditions of pre-electronic communication technology*. The ability of networks to introduce new actors and new contents in the process of social organization, with relative independence of the power centers, increased over time with the evolution of communication technologies.

Network Society

Three processes led to the Network Society (in the late 20th century):

- The restructuring of industrial economies to accommodate an open market approach.
- The freedom-oriented cultural movements of the late 1960s and the early 1970s, including the civil rights movement, the feminist movement and the environmental movement.
- The revolution in information and communication technologies.

Network Society

- A network is a set of interconnected nodes. A network has no center, just nodes. Varying relevance of nodes. Absorbing more relevant information + processing info more efficiently -> more relevance.
- When nodes become redundant or useless, networks tend to reconfigure themselves, deleting some nodes, and adding new ones. Nodes only exist and function as components of networks. *The network is the unit, not the node.*
- Networks involve multiple links between different nodes.
- Nodes are centres within communication networks that can both send and receive messages.
- Individuals can be seen as nodes. But nodes can take non-human forms as well. For example, communication centres, businesses, government departments.

Nature of Networks?

- Networks can stretch across natural and cultural boundaries.
- They are interconnected with numerous other networks.
- Location of power can be harder to pin down in networks.
- Horizontal connections between networks can make exercise of hierarchical authority more difficult.
- Social change also occurs easily in networks.

Digital Communications

- Privatization of the internet, development of new software, increased capacity of telecommunication systems and penetration of the internet into more aspects of social life has led to globalization.
- 'Digital divide' is overstated. Digital technologies are spreading to 'developing' countries and while there are problems of access, studies from the ground often throw up counter-intuitive information.
- Multiple ways of accessing the internet, on a wide range of devices.
- New forms of communication, transcending traditional media. Ability to interact with multiple people across geographic space and time zones. Large-scale interactive communications are now normal.
- THEREFORE, new 'spaces of virtual reality' have been created, where individuals live virtual lives.
- Increasing blurring between 'real' and 'virtual'. Virtual reality does not only impact the virtual world. Seeps into the real world.

Digital Communications

- New technologies have caused transformation in space and time of human experience.
- Space is now intangible, and based on experience, rather than on physical reality.
- Physical proximity is the 'Space of Contiguity', where the physical and virtual coexist.
- Physical proximity, physical space is no longer required for interactions (SMSs, messaging etc.). So Castells speaks of the new 'space', the 'Space of Flows'.
- Physical proximity (or the space of Contiguity) is still important. Exemplified in modern cities, which are conglomerations of vast populations. They remain important because are major NODES within global networks.
- Metropolises are important because they have highly sophisticated communications necessary for the Space of Flows, AND physical proximity required for the Space of Contiguity.

Digital Communications

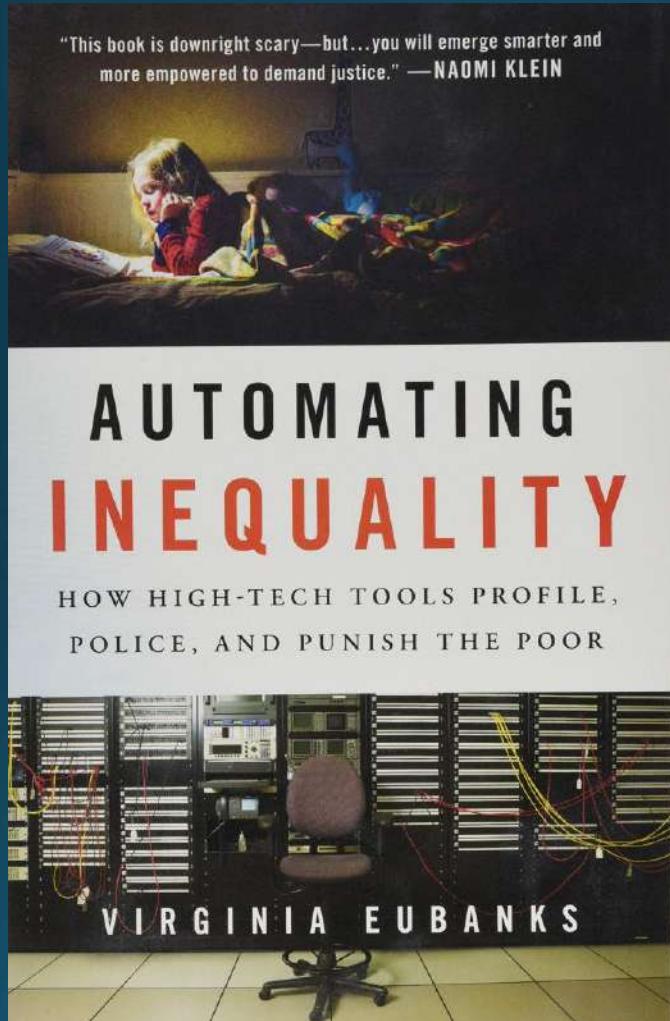
- Characteristic of the Network Society: Creation of “GLOCAL”, global locals, regions are connected globally but have very distinctive local features.

But if the concept of space changes in network society, what of time?

- Industrial age: the clock was the center piece. The means to regulate the shop floor.
- Network Society is characterized by Timeless Time.

Why is the concept of Network Society important? Because it illustrates the central characteristics of the digital world (flexible, deeply networked, so-not-obviously hierarchical, dispersed power...).

Digital Technologies in Practice



- Documents THREE cases studies in the US, where technology was introduced in public delivery systems.
- Three regions, three different programs.
- Justification: Efficiency, Neutrality, Cost-effectiveness.

Programs studied:

- Indiana: Public program to deliver healthcare, food stamps and cash benefits to the poor.
- Los Angeles: Program to allocate housing to the homeless.
- Pittsburgh: Child Welfare Agency

Digital Technologies in Practice

- Redflagging: Targetting for digital scrutiny is *largely* as members of social groups, NOT as individuals.
 - Higher burden of monitoring and tracking borne by people of colour, migrants, unpopular religious groups, sexual minorities, the poor etc.
 - Targetted groups include those who face long-term challenges to steady employment: racial discrimination (the 10% rule, pg 26), single parenthood, disability, chronic illness.
 - More suspicion -> more targeting, scrutiny -> more marginalization. Vicious cycle.
- Technologies of poverty management are not neutral. They are shaped by fear of economic insecurity and hatred of the poor. Example: TANF (Temporary Assistance to Needy Families). Read pg 7.

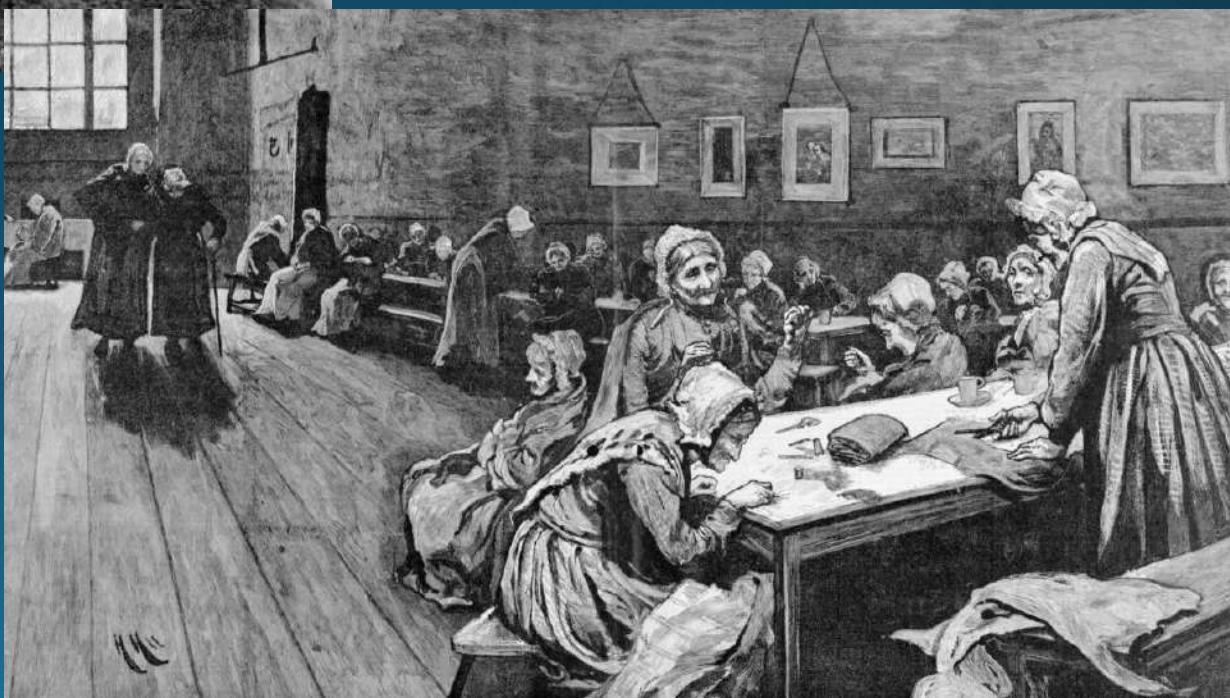
“Automated decision-making shatters the social safety net, criminalises the poor, intensifies discrimination...”

The Poorhouse



Designed to deter the poor from accessing public resources. It polices their labour, spending, sexuality, and parenting. Tries to predict future behavior, and punishes and criminalises those who do not comply.

"Welfare required that poor people trade their rights – to bodily integrity, safe work environments, mobility, political participation, privacy, and self-determination – for meagre aid for their families"



Digital Technologies in Practice

From the poorhouse to the digital database: Roots lie in “scientific charity”; the need to separate the “good”, deserving poor from the “bad”, undeserving poor.

“The conflict between expanding legal rights of welfare recipients and weakened support for public assistance was resolved by a wave of high-tech tools”.

EXAMPLES:

- 1973: nearly half of people living under the poverty line in the US received AFDC [welfare support]. A decade after the use of high-tech tools, this has fallen to 30%. Today, it is 10%.

Essentially, we are seeing an EXPANSION of the poorhouse, powered by digital technologies.

Digital Technologies in Practice

Indiana: Digitised several public services (Medicclaim, food stamps etc.).

Face-to-face case workers -> Electronic communication.

Positive error rate: 4.4%, Negative error rate: 1.5%. So the system was seeing 3% leakage.

- One million applications for healthcare, food stamps and cash benefits were denied in three years. WHY? Because any application mistake (however small) was interpreted as “failure to cooperate” and automatically denied. Redressal process was long and largely useless.
- Severing relationships between caseworkers and clients -> No option for human intervention based on personal knowledge of the case.
- Explosion of errors that slowed or terminated applications. Excessive wait times, lost documents, inaccurate data, interview scheduling problems, slow application processing.
- Positive error rate: 7.2%, Negative error rate: 12.2%
- Race: Pre-automation, Blacks constituted 46.5 of recipients. Soon shifted to 32.1% (though Black population had increased).

Digital Technologies in Practice

Indiana: Digitised several public services (Medicclaim, food stamps etc.).

KEY point:

What was encouraged: reducing response time.

What was NOT: Accuracy of determining the worth of a case.

Efficiency and savings were built into the contract, transparency and due process were NOT. Class and Race bias was embedded/encoded in the performance metrics and business process.

Upturning a key judicial principle: Better to let 10 guilty go free rather than convict one innocent.

Digital Technologies in Practice

Los Angeles: Programme to allocate public housing for the homeless.

Automation suggested as a method to address mismatch between supply and demand.

TWO principles: Prioritisation (crisis versus chronic homelessness), and housing FIRST. Applicants graded on a scale of 1-17. 17 was deemed most appropriate to be given housing.

- Massive arbitrariness in allotting grades.
- “You are interviewed OUT of the services”.
- Data being held for purposes of surveillance and criminalization of the homeless. Homelessless -> Warrants -> Identification and arrests of “fugitives”. Exacerbated by data collection, central storage and sharing.

Digital Technologies in Practice

Pittsburg: Child Welfare programme. Automation suggested as a means to improve prediction of a child's welfare.

Used 132 variables: Length of time on public benefits, past involvement with the child welfare programme, mother's age, born to a single parent, mental health, correctional history...

- Wrong around 70% of the time.
- Links to public welfare skewed results (parenting while poor versus poor parenting)

Outcome variables: Uses community in-referral as a proxy for mistreatment.

Predictive variables: Does “data dredging” or statistical fishing expedition

Validation data: 76%.

KEY problem: It predicts *referrals* to child abuse rather than abuse itself.

Digital Poorhouse versus Traditional Poorhouse

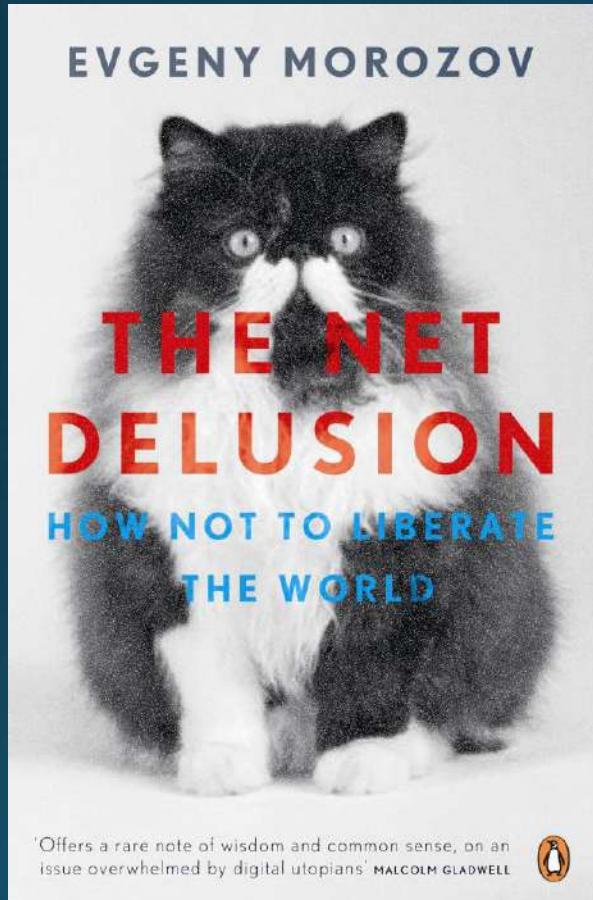
- The Digital poorhouse is hard to understand
- The Digital poorhouse is massively scalable
- The Digital poorhouse is persistent/eternal?

Basic Argument:

- Introduction of internet/social media is NOT a magic wand to bring in democracy to totalitarian states.
- NOT the next instance of smuggled, photocopied material which brought the USSR down.

WHY?

- Double-edged sword: Regimes use the same tool.
- Social media/internet can act as a good pressure releasing valve.
- Data shows people are more interested in cultural content rather than political messaging.



'Offers a rare note of wisdom and common sense, on an issue overwhelmed by digital utopians' **MALCOLM GLADWELL**