Guide to Not Doing 392 Readings

A.K.A Cliff Notes

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Contents

Do Artifacts have Politics?

- The idea is that tech can have no only technical qualities, such as their efficiency or environmental consequences but also have a political aspect in as far as what authority they represent.
- Some argue that tech like solar power leads to a more politically free society where as the safe use of nuclear power would like to a more authoritarian form of gov.
- The debate becomes whether or not the tech has any political connotation past the obvious reflection that “its how you use it”
- One striking example is the design of new York overpass which at 9 feet tall would never allow buses used by the poor/minorities to access the same places as those in cars.
- Another example is the casting machine that was installed at an extremely high cost but did not yield better product, it was just used to get rid of skilled workers and destroy the rising union.
- What we see here (tomato research) instead is an ongoing social process in which scientific knowledge, technological invention, and corporate profit reinforce each other in deeply entrenched patterns, patterns that bear the unmistakable stamp of political and economic power.
- Some of the most interesting research on technology and politics at present focuses upon the attempt to demonstrate in a detailed, concrete fashion how seemingly innocuous design features in mass transit systems, water projects, industrial machinery, and other technologies actually mask social choices of profound significance.
- There are two basic ways to advance the idea that technology is inherently politic; One version claims that the adoption of a given technical system actually requires the creation and maintenance of a particular set of social conditions as the operating environment of that system. Which means that a certain system could not function without the correct social systems around it (like nuclear power requires the right people in charge to work).
- The other form is to say that they are part of the social setting in which they exist but not necessarily required, ie solar power would encourage decentralized power because smaller systems could be advantageous over large plants.
- One question that arise is whether or not we could make do with different types of organizations, there is much evidence that large hierarchies work but that doesn’t mean other necessarily wouldn’t.
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The intersection of Culture, Gender and technology

He argues that certain technologies are geared towards men or women, that they can be used to reinforce or break gender systems.

To get a more equitable gender system we will have to change our technology.

The background or basis of his analysis is that because technology typically changes at a faster rate than gender as an ideological system, he will analyze how new tech affects existing gender constructs and classifies the interactions in four ways, that can happen together or separately. The four interactions are " how tech is engrained into gender", "tech that reinforces gender stereotypes" , "tech that fights gender roles" and "tech that directly breaks gender ideas".

"How tech is engrained into gender"

Historically speaking, men have been associated with technology and progress while women were associated with nature. This lead to some women inventors being ignored as well as the fact that "women" technologies like cooking and sewing being discredited, even though their complexity could be quite high. Also brings up the idea that even though men are "tech savy" in modern complexity a man or women are often equally useless at fixing something if they both haven't been trained.

"tech that reinforces gender roles"

Certain technologies reinforce gender roles accidently while others are straight up meant to continue the oppression of one gender. Aggressively marketed cosmetics reinforcing gender stereotypes and ideals is a good example, (the most straight would probably be a chastity belt). Specifically marketing toys for boys or girls is also a way in which tech reinforces.

"tech that defy gender roles"

These technologies are those that remove the engrained idea that certain jobs/tasks/hobbies. The simplest example has to do with jobs that required physical strength and as such were tailored to men, this is rarely the case anymore as new machinery really has removed that requirement. Other things that fall into this category are the ones that simply remove gendered tasks and replace it with one that is gender neutral. For example getting water for the house was a women's job, but when internal plumbing removed the need for that the new tech did not carry over the gender association (ie using the faucet was not a womens job)

"tech that breaks gender"

These are those that directly blur the line between genders, things like hormone therapy or gender change surgeries. These make it harder to really define a gender, because they even blur the line between sexes

Technologies as Forms of Life

- Synthetic conditions generated in the training had begun to seem more real than the actual experience. (Simulating artificial reality makes it difficult to appreciate what actually is/what is trying to be recreated)
- The basic task for a philosophy or technology is to examine critically the nature and significance of artificial aids to human technology.
- Technology has never been a topic of respectable topic of philosophical inquiry. Engineers are often unaware of the philosophical questions their work might entail
- Asking questions about the profession is not welcomed. “unexamined life is not worth living”
- Asking philosophical questions about the foundation of practices and technology are never asked because of the concept of progress. We think the next wave of innovation will be our salvation
- The negative environmental and social effects of tech advancement have no changed this idea
- Another reason why the philosophy of tech is never examined, and this is because of the relationship between humans and tech is too obvious to merit reflection. Separating technology into two categories: making and using
- Tools can be used “well or poorly” or to do “Good or bad”; technological use does have moral context.
- Technologies are not just aids for human activity anymore; they are becoming powerful forces that reshape that activity and its meaning. They cannot be viewed as merely objects when they have such a profound impact on life and morality
- Idea of being aware of developing patterns is important
- Knowing how a car operates does nothing for understanding how it has influenced society
- Judgement of a technology is usually narrowly based on efficiency, profit generation, and need. Rarely do we consider “secondary consequences”
- The construction of technical sytems that involve human beings as operating parts brings a reconstruction of social roles and relationships
- Can no longer imagine life without the technology we’ve adopted
- Tech is not always as trivial as they fundamentally appear to be (example of turning off the TV)
- Tech is no longer “mere”

Beyond Engineering , (choices)

- To many options and combinations make it difficult to decide what's best (ie. Nuclear reactor and furnace)
- Two or more versions of technology compete for adoption
- Assuming the market will do the choosing for them; usually pick "the biggest bang for their buck" however even the market needs to get their information from somewhere
- Often very difficult to predict which alternative will be the best
- Believe that the collective result of semi rational or completely irrational will become rational; "survival of the fittest"
- Best tech doesn't always win. Sometime technology evolves from the foundation of a bad choice. Can depend on factors that have nothing to do with the actual efficiency of the timing. This causes markets to settle on alternatives that all clearly inferior despite being clearly irrational (ie. The internal combustion engine)
- Essentially, we could not consider what may be the best alternative based on the future resources and information we might later obtain on the subject (electric car battery life)
- Economics suggest that a technology is decided through cost, efficiency, meeting demands, how it compares with other tech that do the same job
- Tech depends on timing, content and scientific discoveries/ emphasis on positive feedback
- How people respond often determines what the market does
- Equilibrium means the best management of resources in economics
- Betamax vs VHS is an example of VHS dominating the market over a small advantage without actually being superior/ outcome often depends on circumstance
- QWERTY keyboard system being the most adopted format
- Once a technology has reached a certain level of adoption anyone who chooses an alternative technology ends up paying a premium (ex. Retraining employees to use any other keyboard other than QWERTY format if you choose to use another option)
- In a competing market, winner is usually determined by random events (random meaning has nothing to do with technological merits) this may very well lead to an inferior technology coming on top

Why engineers need public policy training

The major reason is because engineers often need to serve on advisory boards and their advice is often ignored or water downed as they cannot efficiently communicate (here efficiently refers to communicating in a way to leads to the desired outcome). This would be increased if they knew or understood the policy making process.

Another important reason is that the engineering is mostly self-governed and this means an adequate understanding of policy making is necessary.

One way to remedy this was to update the curriculum at both the graduate and undergraduate level to include more econ and managing classes.

Another issue with policy making and engineering is the fact that its not always easy to know what the real “best thing to argue for” is. For example policy makers pushed corn based biofuel but a true lifecycle analysis showed it wasn’t actually much better. There is room for ambiguity.

Moreover, we recommend three general approaches to the practice of engineering and public policy: All engineering has public implications and thus 1. interacts with, and is largely practised within the context of, public policy. The public policy context of engineering is a reality about which all engineers should be aware; 2. Understanding the significant role of public policy can help to make for better engineering solutions and engineering participation in public policy formulation can result in better informed and designed public policies. The engineering profession needs a small number of specialists and public policy advocates to inform the public debate of important issues and to speak to these issues in the public arena from an engineering perspective; and 3. The skills needed to perform well in public policy development overlap with, but are not identical to, those of engineering. Engineers would be more influential and better participants in the public policy process if they understood policy skills better. To this end, engineering curricula should be modified to encompass a public policy orientation.

Do we Need A technology policy

- The US leads in research but loses market shares. This suggest a re-examination of tech polices.

- Defines Tech as sociotechnical systems

- says government should motivate and assist not do.

- Government never managed to run companies successfully so they shouldn't insist on doing it.

- There is no current policy for commercial endeavours like there is for medicine or agriculture.

- Those who are pushing for a policy say it will be necessary to maintain our standard of living and because tech companies need support. Those who are against insist that its meddling with the free market and that is bad and there is no predictive model that show it would help.

Lessons for experience:

- Public policy has existed for a long time on one way or another for a long time though indirect methods. This is means the real issue is not whether or not to have a policy but whether or not it will be explicitly written down.

- what is considered high tech at one time will not be considered high tech a few years down the line so there is no good reason to differentiate between the two in terms of policy making.

-the critical characteristic of contemporary technology as it impacts competitiveness is continuous innovation

-The commercial success is normally enhanced if both process and product are considered as matters for innovations. This lesson is particularly important for the U.S. because many of the recent successes of foreign competitors appear to have resulted from a heavier emphasis on process innovations.

-The sources of and the routes to innovations differ among industrial sectors. In many sectors, small cumulative innovations are critical to commercial success; this is particularly true in relatively mature industries such as consumer electronics and automobile.

-The sociotechnical systems which create goods and services in the late 20th century frequently take the form of networks or webs which transcend single companies and national boundaries.

Four Functions of Technology Policy

1) Climate Setting

Technology is both embedded in and impacts most aspects of industrial societies. As a result, many areas of public policy impact technology. If the general body of public policy does not create a hospitable climate for technological enterprises and innovations.

The diversity of what climate setting entails can be understood by considering the role of policy in the creation of a hospitable climate for each of the three components of a hardware producing-using system: inputs such as labor and capital; organjzational systems; and the international marketplace

Inputs include long term capital investments but also how taxes are structures, how strict business practices are regulated and what is included in health and safety. The other form of input is people and the skills they have, the groundwork for which is layed out by public school and the governments help in higher education of job training,

The last component of climate setting concerns the market. In many sectors, the market is increasingly international. Over time, an increasing number of nations made a trade surplus a high priority national goal. Many instruments can be used in pursuit of this goal, such as surveying of opportunities by diplomats, financing of purchasing foreign companies etc.

2) Surveying

The need for continuous innovations, coupled with the lack of adequate theory, requires technology policy include continuous surveying of the global situation. Under these conditions, surveying is a necessary foundation not only for climate setting but also for coordinating and gap filling. In the absence of predictive theory, the only way to improve policy is to observe continuously and gain experience on how government actions affect such essential activities as: development, research, production, and the use of organizational systems and networks.

3) Coordinating

The need for coordination flows from two characteristics of much of contemporary technology: current technology is often complex, and it is frequently the product of complex synthesis. Many of the most recent advances in technology arose from fusion of two or more preexisting technologies, or from movement of know-how into areas to which it had not been previously applied. Examples include the integration of computers, machine tools, new software, and changed social arrangements as bases for flexible manufacturing.

4) Gap Filling

Gap filling is the clearest and the most controversial of the technology policy functions. Gap filling implies the supply of functions or of organizational arrangements that do not exist and are not likely to be filled by commercial organizations. Gap filling has been common in the U.S. in defense, agriculture, and medicine, but has been rare and ad hoc in the commercial sector.

Gap filling, remains highly controversial because it raises the specter of “picking winners.” 1) supporting commercially unsuccessful products or processes; and 2) giving some companies commercial advantage over others.

Historically, gap filling by governments has taken three forms: direct, contract, and cooperative. The direct mode commonly involves the creation of new organizations by the government to accomplish specific innovations. The contract mode involves government funding of other organizations to do specific tasks. It is the norm in military procurement. One such project involved Air Force funding of the first numerically controlled machine tool to improve aircraft production. This contract mode is especially usefull when a small part of a much larger project is missing.

The cooperative mode in the U.S. is of more recent origin, and its initiation was heavily influenced by patterns developed in Japan (e.g., the VLSI project) and in Europe (e.g., the EUREKA project) where there

are long traditions of cooperative work. In the cooperative mode, government acts to support companies in creating a consortium in order to work on a problem seen as important to the nation.

The Interrelationship of Functions Perhaps nothing is more evident from the preceding discussion than the interrelationship and interdependence of the four functions. Thus, any effort to formulate a technology policy without addressing each of the functions will likely lead to a crippled policy and program.

Unavoidable Tech Policy

Over the post World War I1 period the U.S. has benefited from direct, well developed technology policies in the areas of defense, medicine, and agriculture. These policies produced not only U.S. technological leadership in the three sectors but these sectors also contributed most of the large trade surplus generating products during the 1980's. Commercial technologies, by comparison, experienced poorer performance. This comparison argues strongly for the value of direct, self-conscious formulation of technology policies.

An adequate technology policy needs to serve four interrelated functions: climate setting; surveying; coordinating; and gap filling. A lack of clear delineation of these functions in the past tended to confuse the debates needed to reach appropriate decisions about government support of technologies in the commercial sector. The government also needs to maintain internal expertise to continue surveying worldwide tech to guide the policy to continually evolve.

Technology Assessment: Product or Process?

- Parliamentary technology assessment was institutionalized in 1972 in the United states and later in several European countries.

The 8 functions attributed to technology assessment

1.Fortification of the position in decision making. This mainly refers to technology assessment initiatives instigated by parliaments but also other political and administrative actors who attempt to obtain a stronger influence on decision making by widening their sources of information in respect of scientific and technological developments.

2. Support of the short- and medium-term policy (executive branch and the legislature) and within the framework of the current policy, suggesting aspects such as control, exploration of alternatives, evaluation and, not infrequently, legitimation.

3. Contributing to the initiation and development of long-term policy by providing information about possible developments and alternatives.

4. Early warning, aimed at providing information about possible problematic and undesirable consequences of technological development at the earliest possible stage.

5. Expanding knowledge and decision making about technology by giving support to societal groups as regards the formulation of their own strategy with respect to technological developments,

6. Tracking down, formulating, and developing desirable and useful technological applications for society (constructive technology assessment).

7. Encouraging the general public to accept technology.

8. Promoting scientists' awareness of their social responsibility.

- Initiating and developing future tech is given a lot of attention in writing but not in practice.

- The need for assessment started in the 1960s because huge projects were met with a lot of resistance. There was three main needs for it. (1) the concern about the consequences of new technologies, visible in the upsurge of environmental and anti-nuclear movements; (2) the need for ex ante assessment of large governmental technological projects; and (3) the demand for more involvement by stakeholders and members of the public.

- people for and against large projects presented different accounts of what the effects could be, which made it unclear for legislators so in an effort to get more clear and neutral information they set up the Office of technological Assessment (OTA) in 1972.

- at first it didn't produce material that was good enough but after changing the executive and employing internal and external counsel it was seen as providing neutral information.

- about 10 years after the OTA European countries established their own form. France, the Netherlands, Denmark, United Kingdom, Germany. They all had approx. the same scale, which was about a 10^{th} or less that of the OTA, which had an 18 million dollar budget vs 0.2 to 2 for the others.

- the political landscape of those countries shaped how they were setup.

- an issue with tech assessment is that he work needed to be quality controlled and reviewed by different people to gain credibility.

There are different paradigms under wich tech assessment can be set up

1) Classical Technology Assessment Paradigm

Technology assessment is the systematic identification, analysis and evaluation of the potential secondary consequences (whether beneficial or detrimental) of technology in terms of its impacts on social, cultural, political and environmental systems and processes. Technology assessment is intended to provide a neutral, factual input to decision making.

Problems with this was that it's very hard to foresee issues or be impartial.

2) OTA Paradigm

The crucial characteristics of the OTA paradigm can be summarized as in-depth assessments leading to reports that provide a thoroughly informed analysis of a policy area in a scientifically valid, nonpartisan way, providing options for policy development. generated in a process involving stakeholders and tied in particular ways to a legislative client.

3) Public Technology Assessment

In short, technology assessment is most appropriately, even necessarily, directed at public rather than private decision making, and still more appropriately at legislative rather than executive decision-making. It is particularly in the legislative arena that all interests are represented, that all values can be defended and attacked, that conflicts can be negotiated, and balances struck .... The legislature is, in theory, a forum of representative laymen---certainly laymen in the context of science and technology .... An OTA is one bridge between experts and the public forum, the translator of technical information into public language for debate and decision.

Main point. Involve the people be democratic.

4) Constructive Technology Assessment

Schot and Rip (this issue) describe constructive technology assessment as a new design practice--which include tools--in which impacts are anticipated, users and other impacted communities are involved from the start, and in an iterative way that contains an element of social learning. There is an emphasis on the analysis of the different relevant factors with different backgrounds like economics, the idea is that by studying the tech early on they can shape it to go a certain way.

Main point is to influence the tech based on discussions with people.

Lessons from tech assessment,

Dilemmas,

One important dilemma for the future of technology assessment springs from the fact that there is a multitude of perspectives, with the only common denominator being that technology assessment should help remedy shortcomings in the relationship between technology and society.

A second dilemma for technology assessment, and certainly for its parliamentary variety, is that the activity is essentially an interface between science and policy and that it thus faces all the problems of science as well as those of policy.

Future direction

The Westermeyer report suggested the following quality assurance procedure for consideration in STOA: • the establishment of external advisory panels for all major technology assessment projects; • the use of independent outside experts to review more complete drafts of report~; • implementation of a requirement that draft and final reports be reviewed by at least three people within the organization, and that specific comments be communicated to contractors for revisions; and • the hiring of a full-time editor to improve the readability and presentation of contractor and staff reports before release to Parliament.

The Great Hybrid Car Cover-up

- In 1974 the EPA ran a secret program called the Federal Clean Car Incentive Program. Victor Wouk who had a doctorate from California Institute of Technology in electrical engineering came up with a hybrid vehicle idea that he proposed with his partner to be part of the FCCIP, they got the initial money to develop their idea as part of the program.

- The man in charge of the program did not want to allow it to continue and opposed it at every turn. Eventually the EPA rejected the car through huge amounts of paperwork and Victor claimed it still had to do with the man in charge simply not believing in hybrids.

- Wouk would go on to campaign for hybrids for the next 25 years and most American companies ignored hybrid. Honda and Toyota did not and they dominated the market.

Leapfrogg Energy Technology

- Ex. Lighting rural villages. It is better to use solar panels and flourescent bulbs since they use less power and dont need to be connected to the grid
- Avoid long term environmental clean-up
- Dematerialization of the economy: more is achieved while using less raw material
    - Changes in the “structure” of the economy, building more telephones instead of mailboxes
    - Improvements in efficiency (LED < Incandescent bulbs)
    - Intensity-of-use (how much a society uses a certain material)
        - Tend to rise until moderate GDP, then decline
        - Tend to decline over time
        - Countries that industrialize later benefit more from modern technology since it is more effective when not needing to change infrastructure.

- Leapfrogging technologies:
    - Cellphones over wired phone lines (like in China)
    - Modern Educational Techniques in South Africa
    - Electric Arc Furnaces over traditional steel mills

- Factors to be considered when adopting leapfrogging technologies
    - Striking a balance between labour and capital. Labour is inexpensive in developing countries while capital is not. Technologies which save capital are often justified
    - Innovation suited for the area’s natural resource supply
    - Differences in energy needs due to climate (more heating in the north)

- Ethanol production in Brazil from cane sugar
- Electricity generation from biomass
- Photovoltaics in developing countries
- Electric vehicles
- Wind Energy
    - Good for india

Globalizing Manufacturing Engineering Education

- Manufacturing Engineering as a specialization in the United-States was started in the 60s where supply and demand were a matter of local arrangements but with a competing global economy the need for revamped education is becoming more and more obvious. The first recommendation [by the authors] is to add foreign language training and an extra semester that would be spent abroad.

-they are looking at the percentage of people involved in manufacturing. So total number vs total population in different countries over a long period of time. The data is tabulated but they explain that almost all countries/regions fall into one of four categories.

-Category 1, steadily decreasing percentage. Most European countries, the United-States, Argentina and Australia fall in this category. This shows that for various reasons the relative amount of manufacturing jobs has decreased, but that does not mean we should expect it to eventually go to zero.

- Category 2, steadily increasing includes Mexico and many Asian countries. This is part of a rapid industrialization process. Estimated to peak in the 40% range after which we could expect decline.

-Category 3, places that experienced a well-defined peak throughout the 30 year survey period, like Hong Kong

-Category 4, steady percentage. Includes Canada and other countries that had received fairly low levels of immigrants in those 30 years (relatively speaking) the fairly constant political and social systems may have contributed in keeping the levels fairly steady.

-Globally it dropped from about 5 to 3 percent mostly due to efficiency because the value of goods produced has increased. We should expect a decline in the global % of people involved in direct manufacture in the future.

- (implications of the data). Manufacturing is still a vitally important global activity. The major manufacturing work has moved from North America to Asian countries and with Asian engineers becoming more available, the number of manufacturing engineering jobs in the rest of the world may be on the decline.

-the manufacturing engineering programs they are talking about is basically the industrial engineering program at Concordia.

-Surveying the curriculum of most accredited schools they found very little direct coursework on the impacts of global economies or global aspects of engineering.

- Most curriculums don't involve foreign work. Some say there is no such thing as American or Russian engineering, just good or bad but most top tier firms will want someone who has international experience as that allows them to understand the market much better.

- One program at Northern Arizona University offers a way to complete an engineering degree with an emphasis on international aspects using internet based classes with international partners as well as organizing internships with companies that have divisions around the world. However the program is mostly based with German partners. It is hard to find equivalents in developing countries, the education and financial differences make it much more difficult to partner00 with them.

The Role of Technology in Sustainable Development

- Governments were unable to agree on how to reduce our consumption so improvement will have to come from new and improved technologies, mostly from the private sector.

- Sustainable development was defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- Sustainable policies seek to change the nature of economic growth, not stifle it.

- The technological focus thus far has been on cleaning technologies rather than clean ones. Which means we are trying to fix or clean the problem after the fact rather than creating a new process from scratch, this is usually due to companies not willing to invest in process redesign and does not fix the root of the problem. Often these end-of-pipe technologies can lead to other problems, like more efficient engines burn hotter, but hotter combustions leads to more nitrogen oxides, which cause smog.

-another big problem is that companies will very rarely want to replace machinery before the end of its useful life.

- There is a debate between whether or not the negative effects of a technology are secondary things that designers did not for see or if they're are the direct consequence of a certain tech being too good at too narrow an objective. Ex fertilizers were made to add nitrogen to the soil, then we shouldn't be surprised that we had nitrogen runoff into waterways. It wasn't just a non foreseen consequence. They argue it would be much better if they payed attention to entire systems.

- The term appropriate technology refers to "technology tailored to fit the psychosocial [social institutions, politics, culture, economics, ethics, and the personal/spiritual needs of people] and biophysical [health, climate, biodiversity, ecology] context prevailing in a particular location and period". At first it was focused for low income countries, help them do what they were already doing but better and then it expanded to include high income, this happened during the mid-1970s. This movement has had enough success to be an international level idea but still remains a minority especially in policy making, mostly due to those having interests in not adopting different technologies.

- One of the reasons alternative technologies never get adopted is because engineers and technologists work in a certain tradition or regime based on where they are/ what is normal at the time. The idea is optimize the systems already in place rather than go for radical new ideas and then every once in a while an entire system changes and it becomes the new normal that will be slowly optimized. This tradition shapes and directs the focus of engineers.

- Radical ideas also require social changes which will discourage firms to change. They also go up against the established giants that usually have the lobbying power to divert away from legislation that would help alternative technologies.

- The world will require a drastic change in how goods are produced if there is hope to live in a sustainable manner but that will require both technological change as well as drastic social change.

Industrial Ecology: From Theory to Practice

- The demand in resources had increased and continues to beyond the point of sustainability and as such we will need to greatly improve efficiency in order to continue to meet demands in the future.

- The process of reducing the number of input units per output unit is referred to as dematerialization.

- By 2040 we would need to reduce our energy and materials input by a factor of 10. Which isn't as crazy as it may appear. Japan reduced their consumption by 40% through a huge economic growth. Also, the waste in the U.S. could be worth as much as 400 billion annually had it been used more efficiently.

-Industrial ecology refers to the exchange of materials between industries, where the waste of one becomes the feedstock for the other. Such as using the ash from a coal fired generator as an input for the cement industry.

- A full industrial ecology would have no waste generation, much like a natural ecosystem.

- They define four types or generations of technology, Development-remediation (toxic site cleanup, water treatment, etc.) Abetment (pollutant capture or treatment at the end of production), pollution prevention (industrial process redesign to reduce pollution beforehand) and Sustainable technologies (have multiple benefits and produce very little to no impact).

- The last two are in an infancy stage.

- Kalunborg in Denmark has the best industrial ecosystem right now where multiple business exchange their waste or by-products to minimize waste and the need for raw materials.

- Other examples is the Cleaner production centre in Nova Scotia that helps the business from the enormous industrial park create programs and alliance to reduce waste.

- in Toronto a research team found that the best driving force is to find economic benefits to exchanging materials with other companies, but also that companies do not want to share their info, do not often know what other businesses are around or how they could create exchange programs.

-policies will need to be changed to allow industrial ecology to flourish.

Framing Ethical Acceptability

A problem with Nuclear Waste In Canada.

- (from abstract). Canada's Waste Management Organization (NWMO) has setup an ethical framework to guide how it deals with waste and that if it follows that, they are dealing with the waste ethically, the author claims the framework is flawed for being to vague and having an informed consent clause that it is impossible to fulfill and that because of that the NWMO is dealing with the waste unethically.

-The background is that all reactors create dangerous waste that can be carcinogenic for a million years and work under that assumption that we do have the obligations to safeguard humans and the environment from it.

- Canadian government studied a few options and chose to bury the waste in the rocks of the Canadian shield in a plan they said would take 30 years to setup, 30 years to build and would then have 30 years of active placement.

- the author outlines many questions such as how much risk is acceptable, to which generations, from whom do they need informed consent etc. which are all valid, non-technical concerns that the NWMO ethical framework does not answer.

-the report by the NWMO provides mostly questions and some broad principles on what should guide their decisions but its far from any specifics on what it should do, or how and that means it fails as a code of conduct/ ethical framework. The biggest thing is that questions do not offer any constraints. "Did they do what was necessary to protect the biosphere" if the answer is no. it really didn't help much to have this. (Should be a statement not a question).

-the authors biggest issue is that of informed consent and how it is phrased within the NWMO's guideline, mostly that it cannot be met in such a way, which makes their recommendation not ethically acceptable. One of the problems is that informed consent requires people to know and understand the issue at stake, but nuclear powers decision are made at a time where the future generations cannot consent as they do not exist but they will have to deal with the effects. Proxi consent is not sufficient.

- the idea that we are simply obligated to do "our best" with the waste is flawed because we do have other options.

-another point arguing that we cant have informed consent is that we do not know the true dangers and effects of longer term waste storing and as such we cannot consent to the. So far our data seems to

show a linear dose dependence between exposrure to the radtiation and solid cancer in humans, this means there is no zero risk dose and as such all quantities of waste have risks.

-The NWMO also offers very little information in the event of worst case scenario leaks/ violated standards, all of which are possible.

Nanotechnology Under Democratic Control

- First few paragraphs summarize the nano ethics conference in south-carolina. Highlights a few talks including one that argued that comparing the comparing nanotech and GMO in terms of policy/society acceptance etc. is not a valid argument because nano tech will be spread out through many industries and people wont have deep cultural values as they did with food.

- one issue of the conference was that social scien scholars did not offer perspectives the author felt should have been there such as the fact that only a handful of people in the know are making decisions that will impact everyone and that is accepted as normal rather than highlighted as a problem.

- Author came up with a scoring system based on a bunch of criterias as to how nanotech is being dealt with and gives it a score below 20% but warns that its very basic and should serve for others to come up with their own way.

- He gave early adoption a 3 on 5 because we started studying them sooner than what has been typically done. But he says it's a decade too late to really shape the trajectory rather than only observe it.

- as a positive, nanoscience are more flexible than other cutting edge tech like nuclear reactors.

- Flexibility and speed were the only two decent scores. One of the worst was for "appropriate expertise" because most of those that speak about nanotech are part of universities that doo research on them and thus depend on nanotech. Most would be under an apparent conflict of interest.

- there is very little being debated upon in terms of military nanotech research and development. Much like the conflict of interest isn't.

-Basically nanotech and its directions and social impacts are not being discussed anywhere near enough and it will most likely follow the same business model as other emerging techs were a handful of people will make the decision for the rest of us.

Science and its publics

- The topic at hand is the relationship between the general public and science and the confidence in the advice the government receives.-this feeling isn't new, it has been seen throughout much of history, most advancements are accompanied with doubts. Whether about chemical pollution or nuclear tech.

-they are investigating not the reasons why the doubt exist, but rather why the government choses to deal with them the way that it does. They say they already know the reasons which include lack of awareness and understanding from the public which is pushed along by the media and a lack on from the scientific and political entities to really understand the public's concern.

-the British report suggested to go beyond simply encouraging understanding of science and instead push for more openness in decision making and greater dialogue to restore basic trust in science. The author maintains this is not far enough.

-they say it will take more than that to restore faith after issues like mad cow even though it wasn't the scientific community lying but rather the beef industry lying about the safety of the meat. Another example is with GM foods. Even though there is very little evidence to show that it can be harmful the risk still exists and because of that risk and the fact that the public were not included in the division making process has made them. He also uses the idea for the president of south Africa refuting the cause of aids because they mistrust the pharmaceuticals. Which highlights the complicated relationship between scientific progress and economic and corporate interests.

-from the African example we can see that the misunderstanding of science is holding back progress and there is therefore a need to legitimize science based strategies. Return the trust in science. However because of this mentality any critique of science is seen as a challenge to the idea that scientific progress leads to social progress and then those who hold those views are lumped together as being anti-science. This is counterproductive and just seems that "creating a dialogue" is allowing two groups to try and push their agendas.

-we need a new type of dialogue. That has two dimensions one where we discuss and show the positive things that have been achieved through science and another where we allow for legitimate critique of the negative sides whether those critiques are political or scientific but that above all those critiques are necessary and healthy.

-the role of the media is important in opening that dialogue. Trying to move away from the deficit model or the public understanding of science idea, where we assume that all is needed for people to agree

with the tech is to be fed the information until they have understood. Moving to a model closer to dialogue where scientist must engage with the audience and respond to the critiques as well as present the info in a language they can understand.

- The author suggest even this second model is not enough. That it is missing an empowerment component. Where people would be provided with how scientific knowledge is created and applied to be able to choose to endorse it or not. He does not think it will happen, in fact what's really happening is that those who held rigorous critiques are just recycling the mainstream and there's a dumbing down happening that allows some dialogue but not a true one. The solution may lie on the internet and it giving access to the info.

Technology Matters,

Chapter summaries, discussion questions and noteworthy points,

Chapter 1. Can we define technology?

-The first way in which he attempts to define technology is from an evolutionary standpoint, saying humans were the only animal that used tech, but more recently chimps were doing it so the idea is re-adjusted to say humans and evolved primates.

- Technologies are not foreign and separate to human nature, they are a part of it, that's why we evolved opposable thumbs.

- Tools and their use lead to a larger social life.

- Necessity isn't really the mother of invention since a lot of what is invented is superfluous and we come to think of it as a necessity.

- The use of a tool shares some aspects of a narrative because you need to be able to see the plan for the tool, what you are going to do and the result.

-Tools outdate written language.

-The view or opinion of technology and the crats/craftsman who made them changed throughout history in the beginning it was seen as the lowest on a scale of importance (with philosophy at the top) and slowly changing (the romans started praising) until the renaissance where it became extremely well seen, Francis Bacon even imagined a perfect society where the king was advised by scientists and engineers and they had essentially conquered nature which no adverse side effects. It satisfied their material needs but also abolished poverty and brought social justice.

- they advance that technology was wrongly thought of as applied science because it usually isn't scientific breakthroughs that create new tech but rather people who understand material and solve problems in real life that create new tech and that science later describes the phenomena, (although that is changing).

- The steam engine emerged as a result of trial and error and not from the period's research on steam as the inventor could not possibly have read that times research.

- Even the term technology was not really used or common until after World War 1.

- Lewis Mumford even classified different periods in history according to the most prevalent technology of the time.

- They touch on the subject of gender and how as technology grew in significance it all started to marginalize women and turn into male dominated fields.

- Finally the term technology became extremely vague and some started to argue for a more precise definition.

- A lot of it seems to argue that technology was progress until it really picked up significance where we started to lose its aim, this is similar to what was advanced by Leo Marx.

Chapter 2. Does technology control us?

-This chapter debates whether or not technologies are deterministic and those who have argued for and against that point of view and their back ground. Some were socialists some were capitalists.

- An interesting point is that many people believe that certain powerful technologies would never be given up by people once they have been introduced by there are instances in history where this happened, Japanese samurais gave up guns and the Amish do not use modern farm equipment (seems to be working out for them too).

-Even in the Victorian era some people started to believe that tech was advancing at a much faster rate than the governing bodies that could regulate them.

- Karl Marx argued that technology was essentially an unstoppable driving force that negatively impacted the middle class (dumbing down of the work force, cutting wages, automation) and that eventually capitalist businesses would end up with more stock than people who could afford to buy it and that would result in the collapse of capitalism and the emergence of socialism where the tech would help everyone.

-Werner Sombart argued the opposite and said that social change could just as easily lead to tech advance and as such culture and society were the real drivers of change not the tech itself.

- Some would later advance the idea of the impact of technology as if it were an outside force acting upon our societies.

- tech as determinist lacks a coherent tradition throughout history and even though it remains popular David Nye rejects it

Chapter 7 Work: More, or less? Better or worse?

- progress in tech has eliminated the need for much of the hard physical labor which results in some loss of employment.

-other advances have removed the need for traditional workers whos handed crafted items can no longer compete (price wise mostly). This leads to a de-skilling of the workforce and shifts the control into the hands of managers that control the factory floor.

- these changes led to a great deal of unemployment, it also gave lots of power to managers

- the creation of assembly lines lowered cost but also lowered quality and customization.

- there is however the notion that mass production is not as easy as anticipated and didn't completely remove the need for certain skills.

- There were many strikes against low wages, but also against working conditions, benefits and the monotonous nature of factory work.

- the Japanese introduced lean production, which allowed small groups to work together to complete a set of tasks rather than a single worker doing a single task. This was better for the workers, they were also given the authority to stop the line to fix issues, greatly improving quality.

-accompanying lean production, was the idea of "just in time delivery" which meant parts arrived at the factory just in time to be use and finished products were built just in time for orders to be fulfilled, avoiding the need for warehousing, which also reduced cost.

- eventually however people wanted different things than factory built and many had to close.

- the implementation of the computer in the workplace changed things again, managers wanted to control workers with-it but the spread of information actually led the other way which brought back workers and cut down some management.

- Nye brings up Walmart and mc donalds that have very little skilled workers and how they thrive because they have extremely expendable employees and how getting rid of them and retraining somebody else is cheaper than paying them benefits.

- the overwhelming point Nye is trying to make is that different technologies shape the way work is done, both through time and around the world, he also highlights that different countries with different values implement it differently and use its benefits differently. This means there is a continuous redistribution of work with new tech and that this process is not about to come to an end.

Chapter 5 Cultural Uniformity or Diversity

The underlying issue explored in this chapter is whether or not improved technology is dissolving distinct culture into one global system or if this same tech is actually creating more social difference.

Historically (last 100 years) sociologists argued that technology and mass production was homogenizing people into one. This was most obvious in the 1930s where towns 1000 miles apart were still identical and the average American wanted to be like his neighbor. This seemed to remain the case until the revolt of the 1960s which was a combined revolt against the Vietnam War, institutionalized racism, and the process of standardization. Three examples are then given: the town of Levittown, Ford and the model T and AT&T and their one phone. All three were originally a mass produced, non customized item before times dictated that they should change. The houses were modified by different generations of owners, ford offered different cars/colours. The phones became extremely varied especially with the introduction of the mobile phone. Also the introduction of department stores and how the demand started to shape the supply.

People had overestimated how strong an effect mass production would have on the standardization of people.

The most powerful example is the computer. It was long feared as being the ultimate in standardizing and central control and collect of information but instead it became the ultimate driver of diversity.

With computers came internet access, but that access wasn't even in all homes. Whites and Asians had the highest percentage and African American and Hispanics the lowest. Even when accounting for income differences, the same breakdown occurred. This seemed to be rooted in different cultures having different priorities. (the gap was non gendered).

The gap world wide was even larger.

Studies of the internet in Trinidad found that the locals weren't afraid of being absorb in a global mass but rather they used the internet to strengthen their local self, to teach others about their islands and spread their music.

Not everyone agrees, some say the world is being "mcdonalized" and local cultures are being erased, others argue that people only adopt some things from the global market that fit into their daily routines and that the global market has led to new combinations like Cuban-Chinese cuisine.

On the one hand we have access to such a wide variety of products and foods its easy to be unique but the counter argument is that all of is made much the same way, planned by those who profit off of it. (think food court, might be different foods but all meals are made and consumed much the same way).

Essentially tech gave us millions of choice to be unique but also removed the meaning of all those choices, for example removing the tradition behind the creation of some meals.

Chapter 3 Is technology Predictable ?

Is technology predictable? In a nutshell, no.

- There are a few different types of prognostics
    - Predictions (really far away by writers/dreamers)
    - forecasting (by engineers and entrepreneurs, less than 10 years)
    -projections (designers and marketers, less than 3 years time, just new models)

- Predictions are almost useless they are essentially a shot in the dark and engineers or artists or random people have essentially the same odds.

- even forecasting is extremely difficult because something that has nothing to do with tech can come out of nowhere and screw up what is expected to happen, for example nobody has forecasted the baby boom that derailed many tech.

-short term projections can work if the economy is stable but it rarely stays like that for long so if a company is lucky, it may happen. But it has more to do with luck than projections.

- another interesting idea is that of smaller companies coming out of nowhere and toppling off giants because those large ones are too invested in one idea and cant innovate like small rivals.

(remainder of the chapter repeats same points as the "choices" reading.)