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Considering the vigorous drive to insert ever more artificial intelligence (AI)-enabled technology into modern societies — from household appliances and personal assistants to business planning and guidance systems — it seems urgent to ensure that the kinds of AI we develop and deploy provide useful tools in the service of humanity, rather than constraining frameworks to limit humanity. In other words, we need “AI for humanity” (1), rather than humanity for AI; or, “human-centered AI” rather than “function-oriented AI” (2).

This challenge is hardly confined to the AI domain. It extends to most computer-based systems, and, indeed, to all technology (3)-(6). As an immediate disclaimer, this, of course, is *not* about rejecting technology and modern civilized life. Rather, it is about ensuring that the technologies we develop and employ are tools (means) that help humans pursue meaningful purposes, and fulfilling lives, rather than becoming purposes (ends) of their own justification.

This, then, begs the question of why do we develop and use certain technological devices or formalized procedures. Often, the answers to this question, across a wide range of examples (some discussed below), seem to boil down to two main reasons. First, one uses devices as fun,

Efficiency versus Creativity as Organizing Principles of Socio-Technical Systems

Why Do We Build (Intelligent) Systems?

fashionable, somewhat useful gadgets, that also display and communicate one’s status — e.g., “smart”

watches, sports trainers, or home assistants (7). Second, one appreciates technology for its ability to



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enhance efficiency — the general idea of “more for less,” with a wide range of ramifications and meanings. More efficiency means achieving the same results, with fewer

(ICT) has further increased the efficiency of data-processing tasks. More recently, AI has been employed to increase the efficiency of tasks requiring information analysis, expert knowledge, critical thinking, human judgement, and creativity. These developments made perfect sense for enhancing the means of production in industrial, capitalist market societies, and for supporting better standards of living overall (10). At the same time, as with any tool, skill, or ability, one must be vigilant in its adopted ways to avoid sliding from useful to pathologic employments.

For instance, AI-enabled technologies that seem highly useful are employed in systems for detecting and signaling emergencies (e.g., home supervision for the elderly; accident signaling for outdoor sports and car traffic); coordinating rescue operations (e.g., emergency response to floods, landslides, and earthquakes); weather and climate forecasting; preliminary medical diagnosis; communication and orientation support for the visually or hearing impaired; management of large-scale data processing and communication infrastructures; or space missions.

At the same time, examples of applications where efficiency optimization is harder to justify include formalized, automated, or AI-enabled management of education and healthcare. Will the quality of such services be the same, only with more efficiency? Or, is “efficiency,” i.e., cutting costs, becoming an objective more important than the original service? What are the side effects on human activities, skills, and expertise?

Most gadgets are also often justified by their increase in effi-

ciency for tedious user tasks. A smart watch allows one to view incoming messages in a wrist twist rather than a long reach for a smart phone. A home assistant such as Alexa can play music and switch on lights by voice command, rather than by reaching for a button. Yet, behind this user-focused simplicity there lies a vast infrastructure of networks, server farms, data collection, and processing algorithms, expending significant amounts of energy (11). Hence, holistically, the overall efficiency of the entire production and utilization process of such gadgets becomes questionable.

This article aims to bring to the fore: the implicit values behind current technological developments — mostly efficiency-driven; the potential negative impacts of unquestioned technological developments and usage — e.g., the totalizing supremacy of quantity over quality; alternative ways of developing and adopting technology — e.g., as tools rather than controllers; and the necessity to permanently analyze, evaluate and alter technical systems during development, before adoption, and as their side effects become obvious. It also aims to emphasize that criticizing certain kinds of technologies is not at all equivalent to being technophobe, or against progress. That would be like equating a critique of fast food to an unnatural stance against eating.

Finally, technical developments cannot be considered in isolation. They are a key part of a self-promoting system of market-driven production and socio-political transformation. Hence, effective change cannot occur via simple immediate reform but rather as a series of piecemeal alterations acting holistically and over a longer term.



What sense of worth and dignity can a person have when their daily activities are confined within systemic contraptions where personal input, originality, and initiative are either undesirable, or quantified as targets to be maximized?

resources — e.g., cheaper and faster (8). Hence, efficiency is a characteristic (means) of the process that achieves an objective; rather than an objective in itself (end). Both of the above are legitimate reasons, as long as they are identified clearly for what they are, rather than allowed to take on unreasonable proportions, deformed meanings, or justifications of their own.

As any technological innovation brings risky side effects (short, medium, and long term) (9), the adoption of a novel device and infrastructure, as well as its continuous usage, should be accompanied by an inquiry into its holistic benefits. What is it more efficient for? And for whom? What are the potential side effects? Are the benefits worth the potential risks?

Over the last centuries, industrialization and automation have significantly increased the efficiency of production processes that necessitate physical labor. Information and Communication Technology

To Change or Not to Change

Technological innovation, or indeed any innovation, brings side effects and opens new potentials. Change, or “progress,” has always attracted both supporters and critics, as attested by writings (at least) as old as antiquity.¹ The ancient Greeks aspired to world stability and considered change not as progress but as decadence. For instance, in Karl Popper’s writings on “The age of Plato” (12), Plato seeks to arrest all societal change, which he sees as a threat to social stability. He thus aspires to create an ideal state (*The Republic*, ~380BC) to be preserved by whatever radical means. Human values of good, evil, morals and justice were reinterpreted from their relation to stability: “Evil is everything that destroys or corrupts, while good is everything that preserves.” Similarly, throughout the Middle Ages, despite increasing technological know-how, innovation was considered a “monstrosity, a sin. It endangered the economic, social and mental equilibrium”² (14, p. 254).

Surely, today, such views are synonyms with anti-civilization and anti-progress. The benefits of change and innovation have been confirmed by the achievements of the industrial revolution and scientific developments; and more recently by digital computing and communication developments. The danger now may be in swinging from seeing all change as bad to considering all change as good, as if driven by some hidden law of progress (12). More and more, any critique of technology risks attracting immediate discredit-

ing as an enemy of natural progress, and prompt equation with irrational fear of inevitable world transformation (e.g., as pointed-out in (13)).

Yet this is not about arresting technological development. It is about questioning and deciding which kinds of technologies, including AI, we develop and use, for which purposes and by considering which human values. As Norbert Wiener highlighted in *The Human Use of Human Beings* in 1950 (15), it is not so much about *know-how* as about *know-what*: “determine not only *how* to accomplish our purposes, but *what* our purposes are to be.”

From Technology to Society

So what sorts of technologies should we develop and for what purposes? And what might be the consequences on individuals and the society?

Ursula Franklin³ regarded technology as not merely machines or gadgets, but as an entire system of methods, procedures, organization and ways of thinking⁴ (4). Hence, she argued, any (technological) tool shapes not only the way we do things, but also what kinds of things we do and how we think about them —

“Is there anybody here who knows what an electronic microscope does to a research group? Everything suddenly has to be observed at two thousand magnifications because you have that expensive beast.”

Hence, one must pay close attention to the kind of tools they develop

and use, to the way they use them, and to the purposes for using them.

Franklin also identified two kinds of technology. On the one hand, holistic technology provides tools that assist skilled craftsmen throughout the production process. On the other hand, prescriptive technology provides constraining frameworks of large-scale production that promote division-of-labor, organize work into predefined sequences, and require supervision by managers. Franklin argues that the prevalence of prescriptive technology in our societies leads to the atrophy of critical thinking and encourages a culture of unquestioning compliance.

This phenomenon now seems to extend from the production of goods, which mostly required physical labor and crafting skills, to the production of all services, including those that require rational thinking, judgement, and creativity.

This shift from holistic to prescriptive technologies can be observed at a conceptual level in the transition of the meaning of “division of labor.” In *The Republic*, Plato considered that society was more efficient if everyone specialized in a specific craft, like shoe-making, carpentry, agriculture, and so on (i.e., holistic division of labor). More than two millennia later, Adam Smith proposes in *The Wealth of Nations* (1776) to further divide labor by only having each worker perform a single step of a production process, like one of the 18 tasks needed to produce a pin — e.g., metal cutter, pin drawer, roller, finisher, and so on (i.e., prescriptive division of labor). While this improves the efficiency of each production process, Smith also warns that

“The man whose whole life is spent in performing a few simple operations, of which the effects are perhaps always

¹“The dogs bark, but the caravan goes on” – Middle Eastern proverb, suggesting that “progress” goes on despite critics.

²Original version, in French: “l’horreur des nouveautés n’aît agi avec plus de force anti-progressiste que dans le domaine technique. Innover était là, encore plus qu’ailleurs, une monstruosité, un péché. Il mettait en danger l’équilibre économique, social et mental.”

³Experimental physicist, known for writings on the social and political effects of technology.

⁴This idea is somewhat analogous to Marshall McLuhan’s view on the way in which the actual means of communication have a significant effect, over the long term, on the content and habits of communication (famously phrased as “the medium is the message”) (9).

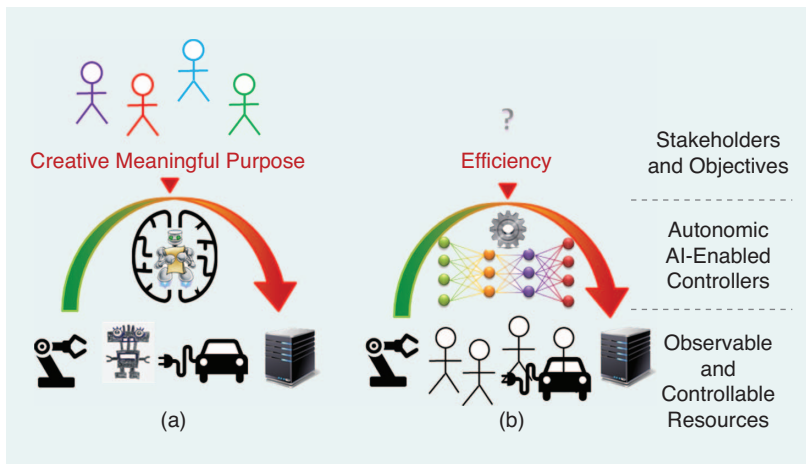


FIGURE 1. (a) Human-centric, versus (b) Efficiency-oriented, technology. Top: stakeholders specifying system objectives; Middle: Control system based on autonomic and AI algorithms; Bottom: observable and controllable resources, used to achieve the system objectives.

the same, or very nearly the same, has no occasion to exert his understanding or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become.”

As a further example, in *The Myth of the Machine* (1967) (5), Lewis Mumford offers a view of technology (or machines) as a principle and framework for organizing and structuring societies. He aims “to question both the assumptions and the predictions upon which our commitment to the present forms of scientific and technical progress, treated as ends in themselves, have been based.” He identifies the Mega-machine as a social structure for coordinating a vast workforce for achieving huge complex projects. While technology could be employed to support human-enhancing values and capacities (moral, aesthetic, creative, cognitive), it can also be

developed to restrict human action and thinking to precise well-coordinated processes; hence rendering the above values superfluous.⁵ In this latter approach, machines become more life-like, while humans become more machine-like.

Finally, an essential critique comes from Jacques Ellul’s⁶ broad view of technology as a system that aims to increase efficiency at all costs; that for doing so redefines the sociological and economical realms; and that develops without purpose other than its own expansion. Ellul also differentiates between machines used traditionally as tools for assisting production, and the entire technical system (“système technicien” (3), 1977) that extends

⁵In “Homo Technomorphis,” William Manson describes Mumford’s dystopian view: “The beleaguered — even ‘obsolete’-individual would be entirely de-skilled, reduced to a passive, inert, ‘trivial accessory to the machine.’ Technical surveillance and limitless data-collection — ‘an all-seeing eye’ (Panopticon) — would monitor every ‘individual on the planet. Ultimately, the totalitarian technocracy, centralizing and augmenting its ‘power-complex,’ ignoring the real needs and values of human life, might produce a world ‘fit only for machines to live in.’”

⁶Historian, Philosopher, Sociologist, and Theologian, Professor of History and Sociological Institutions; of his numerous writing many treated the impact of technology on society.

to the organizational methods of the social and of working environments.

Modern Inversion of Purpose

Information and Communication Technology has been promoted as an empowering means to assist human activities and improve human life — e.g., from the use of Internet for communication and knowledge sharing, to relatively recent developments in autonomic control and artificial intelligence. This vision, however, when situated within a predominant drive to maximize efficiency, may be diverting towards different goals.

When initiatives such as autonomic computing were launched initially (19), the motivating vision was that of automatic control processes assisting human administrators in complex management tasks. The machine was to handle the tedious, processing-intensive operations, while the human could concentrate on high-level, strategic, creative matters (Figure 1(a)). Nonetheless, recent research seems to progressively veer off from this initial vision towards an inverse mindset where autonomic processes are employed to optimize human activities (Figure 1(b)) — e.g., to create the most efficient teams based on given tasks and worker skills, or determine the most efficient schedule for a human workforce.

Similarly, AI was initially intended to assist humans with complicated information-intensive tasks (Figure 1(a)), such as diagnosis (e.g., expert systems), decision making (e.g., emergency planning), and knowledge support (e.g., cognitive environments) (17, 18). Here, as well, an alternative direction is pursued increasingly, where AI replaces human judgement to find optimized answers “more efficiently” (Figure 1(b)) (e.g., determining one’s eligibility and monthly fee for healthcare

insurance and banking loans, or allocating workers to teams and scheduling their tasks and coordination).

So what and who is this technology for? one may ask (if one still retains that ability).

As the economic focus of innovation has shifted from the extraction and processing of (limited) raw resources to the collection and processing of (virtually unlimited) knowledge, one might believe that access to the means of production of knowledge-oriented goods, traditionally requiring costly factories, can be facilitated for a greater number of economic agents. This is not so, as more and more of the knowledge processing activities that could be performed by humans are transferred to costly AI applications requiring huge amounts of computing and power resources. These are considered more efficient and less biased than their human-performed equivalents.

Still, in what sense are AI technologies “more efficient”? Do they consume less energy? Do they provide better answers? Or are they faster and cheaper to manage than human employees? Also, is the AI-developer’s bias better than the individual’s decision bias? Surely, the answer depends on each application, and a generalizing attitude would be out of place. This article is precisely about emphasizing the necessity of asking such questions, continuously and case-by-case.

How Did We Get Here?

From Life-Long Virtue-Driven Happiness to Instant Satisfaction Maximization

The quest for identifying the essence of human nature, of innate drives, and of moral and ethical values — i.e., what gives human life meaning, fulfillment, and worth — and what is praised as virtue in human

society — has been at the core of philosophical, societal, and political debate since antiquity (at least). We aim here to skim through a few lines of arguments in this sense, so as to put into context the current societal and individual values and the associated drives they currently encourage.

Aristotle considered that while everyone seemed to seek pleasure, wealth, and status, these pursuits were not ends in themselves but mere means to achieve something else. To represent such *ultimate purpose*, an act or value must be self-sufficient and final — “that which is always desirable in itself and never for the sake of something else,” as well as attainable (“Nicomachean Ethics”). He further considered that happiness met these requirements for most humans. Here, happiness (from Greek *eudaimonia*)⁷ is not a subjective temporary state of mind (e.g., winning a prize), but rather a way of life — the continuous pursuit of actions in accordance to accepted morals, over one’s lifetime.

Later moral views from the *Utilitarian Theory* (XVIII-XIX, John Stuart Mill and Jeremy Bentham) considered actions to be good if they tended to promote pleasure or utility, and (or at least), if they tended to promote the absence of pain — importantly, not only for the individual but for everyone else affected (entire community).

This view, however, may lend itself to misinterpretation, and taken as an individual pursuit for superficial and temporary satisfaction (or egoistic hedonism). Indeed, it has been increasingly taken up by capitalist economy theory to mean that self-interested individuals will act to

maximize their satisfaction, utility or pleasure.

This idea of the individualistic pursuit of self interest stems from an interpretation of Thomas Hobbes’ view on the human state of nature, which he argued made individuals compete for the same resources, and therefore required a strong state to avoid continuous war (*Leviathan*, 1651 — leading to social contract theory and the basis of the liberal state).

This drive can also be traced to Adam Smith’s economic theory (*The Wealth of Nations*, 1776) where he proposed to allow self interest to operate for achieving common good — “By pursuing his own interest he frequently promotes that of society more effectually than when he really intends to promote it.” We note here that the self-interested drive of actions represents a mere means to achieve collective benefits, via a decentralized process,⁸ as suitable within a complex economic context. Hence, the human drive for more acquisitions suits here to drive the development of the economic system. It does not represent a core human trait that must be pursued as a goal for a fulfilling life.

The Inertia of Useful Drives and the Neglect of Core Values

Human nature comprises many innate drives that can serve various purposes, suitable in various contexts, or societies. For instance, violent acts of courage were praised in ancient societies where they were essential to everyone’s survival. They have not, however, become ultimate ends of human existence.

As discussed above, more recent times have increasingly encouraged the innate human desire for

⁷*Eudaimonia*: “the state of having a good indwelling spirit, a good genius” (*Encyclopaedia Britannica*: <https://www.britannica.com/topic/eudaemonism>.)

⁸Decentralized markets are ruled by laws of offer and demand; and information-carrying prices — F. V. Hayek, “The Road to Serfdom,” 1994.

maximizing satisfaction or utility (notably via the accumulation of material goods) as a suitable value in societies where the lack of material wealth was preventing decent human living standards — it allowed the capitalist system to increase the production efficiency of material goods, ensuring, in principle, sufficient resources for everyone.

To do so, free market society has placed overcoming scarcity at the core of human consciousness as an organizing principle (10). Yet once this was achieved — once production sufficed to ensure decent living for everyone — the value of maximized utility may have become outdated, unnecessary, and probably harmful. Its continuous pursuit, based on among other things inertia, leads to different outcomes altogether — e.g., increasing inequality in freedom of choice, access to means of production, and civic rights. The initial purpose of collective benefits may no longer be achieved if the majority of actors no longer have access to economic means to pursue their self interests; nor can selfish satisfaction be achieved, for that matter, if that had become a goal.

In Maslow's Pyramid of Needs (16) the above-mentioned human drivers may help to ensure basic necessities (e.g., security, safety, food, water, warmth, and rest). In competitive societies, material goods may also help to ensure status and strategic relationships; just as courageous acts would do in medieval times. Hence they may help fulfill psychological needs of esteem and belongingness. Nonetheless, the highest levels of self fulfillment, related to creative potential, remain untouched by pursuing such drives.

Efficiency's Takeover of Maximized Utility

To maximize the acquisition of material goods, it makes sense to

optimize their production process. This allows performing more activities with the same resources, hence producing more goods, more affordably. This also makes sense in ecologic terms, to minimize waste and ensure sustainability. Yet, this idea seems to have been extended from productive activities to a generalizing concept driving all human activities. As most activities are now modelled as business exchanges between service providers and consumers, the argument goes that the faster and cheaper an action is performed, the more resources are left to perform other actions, which will lead, in principle, to more benefits, satisfaction, and utility — i.e., “time is money.”

Efficiency has thus become the chief end value, so entrenched in (some) societies that there's no longer a need to justify it. If a change or innovation improves efficiency, it is implicitly better, with no further investigation needed. Consequences become irrelevant — e.g., “Move fast and break things. Unless you are breaking stuff, you aren't moving fast enough” (— Mark Zuckerberg). This view increasingly overshadows traditional values like honesty, justice and fairness. It guides not only private economic activities, but also public service and leisure. Even rationality seems to have been reduced to rational choices that maximize efficiency. Ultimately, this leads to no less than a “Cult⁹ of Efficiency” (8).

The various meanings of efficiency are customarily intermixed, causing confusion between efficiency in terms of lower costs or

higher productivity, and between efficiency in terms of lower dissatisfaction or higher contentment for individuals and for collectives. E.g., when patients must be released as soon as possible lest they become negative statistics for a hospital's performance evaluation, what kind of efficiency is being optimized, and for whom — certainly not for the patients, nor for the community.

Moreover, when efficiency is maximized in terms of costs and productivity, the quality of the product in question is often neglected; hence the actual efficiency may not increase.

Is Efficiency Satisfying?

Does efficiency make us human? Does it allow us to express core human nature? Does it provide satisfaction? Does it ensure a fulfilling human life?

Surely, if efficiency allows us to do more things within the time we have, then, in principle, it can free up time from labor and leave it for more meaningful acts. Yet, if we now persist in this reasoning, and pursue efficiency for the acts that we perform within this free time, recursively, then, ultimately, what is the freed-up time for?

Even creative or leisure activities seem to have fallen victims to this efficiency-driven view — e.g., holidays are increasingly and voluntarily packed-full of fun things to do, pushing travel agencies to specialize in maximizing the number of boxes checked per time and price unit.

A severe inversion of values seems to be at play here. Just like happiness is not about feeling something, but about being (or becoming) something (or someone) via one's life-long purposeful actions, also happiness cannot be about performing as many actions as possible within limited time and with minimal resources.

⁹A cult is a system of religious worship that engenders almost blind loyalty in its members. Its mystical rites and ceremonies foster in its devotees a sense of belonging and a reverence of core beliefs. Cult members reinforce these beliefs through the incantation of central dogmas” (8).

Consequences of Efficiency as a Value

Efficiency is habitually invoked as the irrevocable reason for replacing human judgement with AI and other strands of automated systems. Indeed, AI can provide faster responses, allegedly at a lower cost. This tendency, moreover, goes beyond AI. It extends to the general propensity to adopt algorithmic processes. That is, any formal procedure that can be followed as-such, based on predefined measurements and sequential steps, without context-specific exceptions or further judgement, seems to be considered superior and adopted as a replacement for any processes including real human involvement. This is the case whether the measure-oriented algorithmic procedure is to be followed by machines or by (judgement-neutralized) humans.

Take, for instance, smart contracts — formal rules enforced automatically by a computing system. While this may suit the enforcement of quality attributes in strictly technical systems — such as service level agreements for performance insurance in cloud applications — its extension to human affairs seems mostly inappropriate, if not totally ideological. The complexity of human affairs is such that no particular set of non-contradicting rules can provide a course of action for every possible situation, without exception. Indeed, this is why we still have lawsuits rather than automatic application of law. Should we then, for the sake of expediency, renounce the separation of powers and allow developers and ICT providers to mix the legislative (definition of formal rules), judiciary (AI interpretation of rules), and executive (application of rules) into monolithic automated systems? This, of course, is meant as a rhetorical question.

Another simpler yet just as impactful example is the use of predefined measures, e.g., h-index and i10-index, as ways to evaluate academic research. While computationally simple, such measures are employed to evaluate scientific value, worth, and competence, in terms of publication outputs and impact on subsequent scientific works. This involves no complicated AI techniques whatsoever. The computational logic is basic and fully comprehensible by humans, and using limited amounts of data. Its main attraction comes precisely from its efficiency — enabling fast and cheap evaluation by unqualified personnel (cheap), or by overloaded qualified personnel (fast). This is justified via the irrefutable “fairness” of its employment, which removes human bias from the equation, as the same measure applied to all (so would rolling dice). While the inappropriateness of this measure for its declared purpose has been confirmed (e.g., as measuring researchers’ popularity, or network centrality, rather than scientific worth (20), altering researchers’ publishing behaviors in quality-damaging ways), the argument of effi-

ciency as a sufficient justification for its use still prevails.

Overall, as efficiency has increasingly established itself as a core value in human consciousness, the above prescriptive approach — either by classic algorithms or AI-oriented neural networks — has increasingly infiltrated most areas of human affairs, notably including governmental, educational, scientific, artistic, and health-care domains. Additional examples in this sense include the progressive reduction of the humanities, like literature or philosophy, from university curricula, as “non-profitable;” or evaluating books by the number of copies sold or hospitals by profits made. Such measures seem increasingly “natural,” and unworthy of questioning, for increasing numbers.

Moreover, when the current system pushes all individuals and institutions to compete on efficiency-related terms, one may well become fully aware of the overall long-term inefficiency (paradoxically), and meaninglessness, of the situation, and yet be obliged to join the race, and be trapped in the ever faster efficiency cycle (Figure 2).

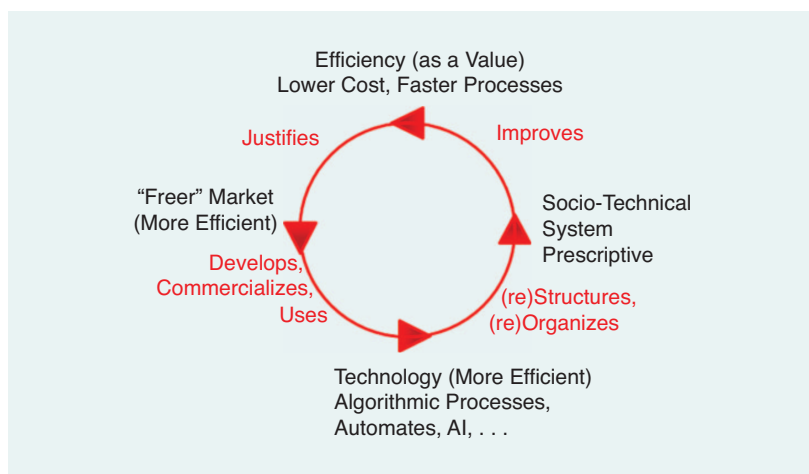


FIGURE 2. Efficiency cycle, with positive feedback: efficiency as a goal justifies freer markets, where resource owners produce and commercialize new technologies, which reshape socio-technical systems to increase efficiency (and often self-interested benefits).

While efficiency can be a valuable attribute for a means to a worthy end, we are at risk of inverting roles and accepting the optimization of efficient means for their own sake, leading to a very different, insufficiently investigated end.

Impacts of Efficiency on the Human Role in Society

As efficiency-driven prescriptive technological processes infiltrate the human world, it seems rather urgent to wonder about the impacts that this totalizing paradigm might have on the human role in society.

What sense of worth and dignity can one have when their daily activities are confined within systemic contraptions where personal input, originality and initiative are either undesirable, or quantified as targets to be maximized? The model of the human role in the overall systemic scheme becomes that of a standardized component, forever insufficiently efficient or precise, competing with myriad similar components (human or technological), seamlessly replaceable at the first hiccup. Surely this is not new, yet the increasing extent to which it now reaches within all sectors of human activity — with ever more sophisticated and efficient (ironically) computational means — exacerbates this issue.

Illustrative examples notably include modern working environments, like warehouses, sometimes stretched over a million square feet — e.g., described in (21) as

“a uniquely 21st-century creation, a vast, networked, intelligent engine for sating consumer desire” ... “a realm where the machines, not the humans, are in charge. the place radiates a non-human intelligence, an overarching brain dictating the most minute movements of everyone within its reach.”

In a related example, the authors of the *Anatomy of an AI System* refer to a patented invention for a sensor-equipped metal cage that can move human workers automatically around a warehouse (just like merchandise) to maintain efficiency and protect them from other machines and robots (11):

“U.S. patent number 9,280,157 represents an extraordinary illustration of worker alienation, a stark moment in the relationship between humans and machines. ... Here, the worker becomes a part of a machinic ballet, held upright in a cage which dictates and constrains their movement.”

In such conditions, what might become of the individual’s sense of societal participation, contribution, belonging, and civic responsibility? Might there emerge a general sense of unfitting, unsuitability to the environment, or worthlessness? Might one start looking for meaningful causes elsewhere? Might any form of collective, group, community, or organization start featuring irresistible attraction, even if the only available ones are of an extreme nature? (e.g., either political, conspiracy-focused, or spiritual).

Moreover, when employees and entire production sites can be replaced like Lego bricks, might there emerge a general sense of individual and social instability and insecurity? Might there emerge a justified drive to take back control? to go back to a Golden Age? But who is the control to be taken back from? And, more importantly, what are the viable action-channels that may help to get it back?

If socio-political structure, increasingly enforced via non-investigated technological processes and frameworks, is such that it discour-

ages organization and renders the impacts of individual action insignificant, might there emerge a sense of helplessness and futility, a conviction of fatality, of implacable law of history, or of “progress”? Is efficiency used as a justifying principle for (re)organizing the socio-political realm in a way that jeopardizes individual freedoms and neutralizes individual and collective capacities for effective action for bringing about change?

In addition to individuals losing, or never acquiring, the knowledge and skills to contribute to liberal democratic systems, the efficiency-first principle introduces an extra impediment for doing so. When one must fiercely compete for all existential means, any effort put in organizing collectives that would benefit all (in the long term) is detrimental to the individually competing agent (in the short term) — i.e., a tragedy of the common working force? Moreover, the cult of efficiency advances its own agenda — that of the “free” market, as a more efficient self-regulatory force than any regulatory organization or state. Those who can own the means of extraction and processing of data, information, and knowledge (i.e., the new raw resources for production and gain) are in a better position to organize and accumulate material and strategic benefits.

Some of the key causes and drivers behind this situation remain largely unidentified. Indeed, how many suspect that the production and distribution framework behind such fun “smart” gadgets and everything-in-a-click efficiency-driven systems may have anything to do with the loss of socio-economic-political control? As long as the real causes remain unclear, the frustrated many will default back to the traditional methods of wall building and scapegoat chasing. A key

ingredient to revert this trend may be the reorienting of technological employments away from means of human constraint and control and towards tools of human creativity and empowerment.

Impacts of Efficiency on Governance, Politics, and Democracy

Efficiency's role in "optimizing" human organisations — from corporations to public institutions and government — is not limited to the operative staff (performing the actual work) but also extends to administrative personnel: decision-making must become increasingly faster and cheaper.

Organization theory stipulates that rational decisions are conclusions-based premises, which can be either facts (means) or values (ends) (22). Hence, an obvious way to optimize organizational efficiency is simply to define efficiency as a core value guiding the organization's decision-making process (e.g., the "be efficient!" commandment, in (22)).

Importantly, AI and ICT can contribute here in several ways. One strategy is to restrict human decisions to a limited set of predefined options, hence speeding-up decision-taking and reducing the need for costly training or higher supervision. This may also eliminate the need for lengthy and costly reviewing processes to evaluate and judge one's decisions. Another strategy is to introduce (AI-enabled) ICT to enlarge the span of control of every human administrative role — i.e., increase the number of subordinates that can be managed, by relying on digital information communication, pre-processing, and storage. This can dramatically reduce the number of decision-making roles in the organization.

Ultimately, these strategies enable better division and isolation of expertise across human adminis-

trative personnel, who become less-and-less skilled, hence easier to replace; and less-and-less empowered and aware of the "big picture," hence unable to challenge top-level authority. This ensures better control and stability of the organization over the long term. Surely, here, humans must be convinced to accept the authority of "black-box" AI agents (24) as sources of unquestionable knowledge and decisions. While one can reasonably expect some awareness, and perhaps sensibility to social ethics, from any human supervisor, what can one expect from an AI agent, or technological process, with an equivalent role? We can already get a taste of this situation by analyzing the behavior of corporations, as opposed to (non-psychopathic) individuals, with respect to societal values (23).

When, in the name of efficiency, the above tactics are applied to government organizations, the result can be a decrease in transparency and in effectiveness of checks-and-balances. As any decentralized decision process, democracy is rather incompatible with optimized efficiency (i.e. speed and cost of decisions). Here, cheaper comes at a cost (in democratic terms). Yet, ironically, the efficiency of (AI and) ICT introduce faster-paced socio-economic changes that would require faster decisions and regulatory updates (e.g., otherwise leading to "institution lag").

Another key democratic process impacted by the race for efficiency is that of elections. Notably, e-voting was introduced to increase the result-processing speed and reduce management costs. So far, this has come at the cost of increased opacity, jeopar-

dized voter privacy (25), and usability (26). Moreover, as recent events demonstrated, aiming to decrease the cost of media news by opting for free, mostly unverified, digital sources, delivered automatically by opaque



How many suspect that the production and distribution framework behind fun "smart" gadgets, and everything-in-a-click efficiency-driven systems may have anything to do with the loss of socio-economic-political control?

AI algorithms, has a non-negligible impact on voter opinions (i.e., values and factual premises) and hence on rational voting decisions.

Finally, the progressive privatization of public institutions, with the declared purpose of meeting increasing efficiency goals, may replace transparent processes by opaque counterparts, which may maintain the democratic iconography but implement different mechanisms; potentially supporting a veritable "coup d'état in slow motion."¹⁰

What to do?

Changing the course of current developments may be one of the things that we cannot achieve "in a click," by the very nature of the self-reinforcing system structure highlighted above. Yet one should not underestimate the inherent power of individual frames of mind, attitudes and actions. Can we consider the following easy cheap ways of conduct?

¹⁰Credited to Canadian writer and political philosopher John Ralston Saul.

- Pay attention when the language of efficiency is being used, and question its suitability, meaning, targets, and beneficiaries case-by-case; e.g., what does an “efficient education,” “efficient research,” or “efficient health-care” even mean?
- Pay attention to the kinds of technological devices we develop and/or use. Beyond their immediate utility, which is quite obvious and quite well-marketed, be aware of how using them alters one’s state of mind, emotions, and behavior. Consider using them selectively, for specific well-suited tasks rather than by default, for everything – e.g., do we have to use a smart phone to control the lights? Are we giving away valuable data or knowledge? Who benefits? What are the impacts?
- Pay attention to the kinds of technological infrastructures that are being deployed in our working, public, and private spaces. How do they alter individual behavior, thinking, and mood; and, importantly, how do they alter human interaction, relations, collective organization and action?
- Pay attention to where these technologies come from, who develops and offers them, who sponsors them, and what their motivations are (including, but not limited to, financial benefits beyond the price on the label – there may be no free lunch).¹¹
- Keep in mind the actual important goals to be pursued and core values to be abided by; and determine the suitability of a

¹¹In Pinocchio’s Funland, food, drinks and smokes were made freely available to all – “Right here, boys! Right here! Get your cake, pie, dill pickles, and ice cream! Eat all you can! Be a glutton! Stuff yourselves! It’s all free, boys! It’s all free! Hurry, hurry, hurry, hurry!” – until they made “jackasses” of themselves, lost their humanity and unsuspectingly transformed into donkeys, sold for labor or circus by the Funland’s owner.

technological device or service accordingly.

Again, this is *not* about whether or not we should develop or use new technologies and AI systems. It is about *what kinds* of technologies and AI we develop and about *how* and *when* we use them. As with any disruptive technology, it may take a while for culture and social awareness to catch-up and readjust to the brave new socio-technical world.

Surely, awareness on its own may not be so helpful in bringing about positive change. Yet it is certainly an essential step, bringing about the potential for change, defining its meaningful objectives, and creating the favorable conditions for organizing and enacting the necessary transformations towards the objectives.

A first essential change may need to be one of frame of mind. We may need to reconsider human values, both for the individual and for society, and rank efficiency accordingly. A second essential change is one of acting according to that frame of mind, on a recurrent basis.

Time is not money—it is time to live a human civilized life, and to ensure that the conditions for it are being created and preserved.

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