

The Techno-Optimist Manifesto

By Marc Andreessen

Lies

We are being lied to.

We are told that technology takes our jobs, reduces our wages, increases inequality, threatens our health, ruins the environment, degrades our society, corrupts our children, impairs our humanity, threatens our future, and is ever on the verge of ruining everything.

We are told to be angry, bitter, and resentful about technology.

We are told to be pessimistic.

The myth of Prometheus – in various updated forms like Frankenstein, Oppenheimer, and Terminator – haunts our nightmares.

We are told to denounce our birthright – our intelligence, our control over nature, our ability to build a better world.

We are told to be miserable about the future.

Truth

Our civilization was built on technology.

Our civilization is built on technology.

Technology is the glory of human ambition and achievement, the spearhead of progress, and the realization of our potential.

For hundreds of years, we properly glorified this – until recently.

I am here to bring the good news.

We can advance to a far superior way of living, and of being.

We have the tools, the systems, the ideas.

We have the will.

It is time, once again, to raise the technology flag.

It is time to be Techno-Optimists.

Technology

Techno-Optimists believe that societies, like sharks, grow or die.

We believe growth is progress – leading to vitality, expansion of life, increasing knowledge, higher well being.

We agree with Paul Collier when he says, “Economic growth is not a cure-all, but lack of growth is a kill-all.”

We believe everything good is downstream of growth.

We believe not growing is stagnation, which leads to zero-sum thinking, internal fighting, degradation, collapse, and ultimately death.

There are only three sources of growth: population growth, natural resource utilization, and technology.

Developed societies are depopulating all over the world, across cultures – the total human population may already be shrinking.

Natural resource utilization has sharp limits, both real and political.

And so the only perpetual source of growth is technology.

In fact, technology – new knowledge, new tools, what the Greeks called techne – has always been the main source of growth, and perhaps the only cause of growth, as technology made both population growth and natural resource utilization possible.

We believe technology is a lever on the world – the way to make more with less.

Economists measure technological progress as productivity growth: How much more we can produce each year with fewer inputs, fewer raw materials. Productivity growth, powered by technology, is the main driver of economic growth, wage growth, and the creation of new industries and new jobs, as people and capital are continuously freed to do more important, valuable things than in the past. Productivity growth causes prices to fall, supply to rise, and demand to expand, improving the material well being of the entire population.

We believe this is the story of the material development of our civilization; this is why we are not still living in mud huts, eking out a meager survival and waiting for nature to kill us.

We believe this is why our descendants will live in the stars.

We believe that there is no material problem – whether created by nature or by technology – that cannot be solved with more technology.

We had a problem of starvation, so we invented the Green Revolution.

We had a problem of darkness, so we invented electric lighting.

We had a problem of cold, so we invented indoor heating.

We had a problem of heat, so we invented air conditioning.

We had a problem of isolation, so we invented the Internet.

We had a problem of pandemics, so we invented vaccines.

We have a problem of poverty, so we invent technology to create abundance.

Give us a real world problem, and we can invent technology that will solve it.

Markets

We believe free markets are the most effective way to organize a technological economy. Willing buyer meets willing seller, a price is struck, both sides benefit from the exchange or it doesn't happen. Profits are the incentive for producing supply that fulfills demand. Prices encode information about supply and demand. Markets cause entrepreneurs to seek out high prices as a signal of opportunity to create new wealth by driving those prices down.

We believe the market economy is a discovery machine, a form of intelligence – an exploratory, evolutionary, adaptive system.

We believe Hayek's Knowledge Problem overwhelms any centralized economic system. All actual information is on the edges, in the hands of the people closest to the buyer. The center, abstracted away from both the buyer and the seller, knows nothing. Centralized planning is doomed to fail, the system of production and consumption is too complex. Decentralization harnesses complexity for the benefit of everyone; centralization will starve you to death.

We believe in market discipline. The market naturally disciplines – the seller either learns and changes when the buyer fails to show, or exits the market. When market discipline is absent, there is no limit to how crazy things can get. The motto of every monopoly and cartel, every centralized institution not subject to market discipline: "We don't care, because we don't have to." Markets prevent monopolies and cartels.

We believe markets lift people out of poverty – in fact, markets are by far the most effective way to lift vast numbers of people out of poverty, and always have been. Even in totalitarian regimes, an incremental lifting of the repressive boot off the throat of the people and their ability to produce and trade leads to rapidly rising incomes and standards of living. Lift the boot a little more, even better. Take the boot off entirely, who knows how rich everyone can get.

We believe markets are an inherently individualistic way to achieve superior collective outcomes.

We believe markets do not require people to be perfect, or even well intentioned – which is good, because, have you met people? Adam Smith: "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own

self-interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities, but of their advantages.”

David Friedman points out that people only do things for other people for three reasons – love, money, or force. Love doesn’t scale, so the economy can only run on money or force. The force experiment has been run and found wanting. Let’s stick with money.

We believe the ultimate moral defense of markets is that they divert people who otherwise would raise armies and start religions into peacefully productive pursuits.

We believe markets, to quote Nicholas Stern, are how we take care of people we don’t know.

We believe markets are the way to generate societal wealth for everything else we want to pay for, including basic research, social welfare programs, and national defense.

We believe there is no conflict between capitalist profits and a social welfare system that protects the vulnerable. In fact, they are aligned – the production of markets creates the economic wealth that pays for everything else we want as a society.

We believe central economic planning elevates the worst of us and drags everyone down; markets exploit the best of us to benefit all of us.

We believe central planning is a doom loop; markets are an upward spiral.

The economist William Nordhaus has shown that creators of technology are only able to capture about 2% of the economic value created by that technology. The other 98% flows through to society in the form of what economists call social surplus. Technological innovation in a market system is inherently philanthropic, by a 50:1 ratio. Who gets more value from a new technology, the single company that makes it, or the millions or billions of people who use it to improve their lives? QED.

We believe in David Ricardo’s concept of comparative advantage – as distinct from competitive advantage, comparative advantage holds that even someone who is best in the world at doing everything will buy most things from other people, due to opportunity cost. Comparative advantage in the context of a properly free market guarantees high employment regardless of the level of technology.

We believe a market sets wages as a function of the marginal productivity of the worker. Therefore technology – which raises productivity – drives wages up, not down. This is perhaps the most counterintuitive idea in all of economics, but it’s true, and we have 300 years of history that prove it.

We believe in Milton Friedman’s observation that human wants and needs are infinite.

We believe markets also increase societal well being by generating work in which people can productively engage. We believe a Universal Basic Income would turn people into zoo animals to be farmed by the state. Man was not meant to be farmed; man was meant to be useful, to be productive, to be proud.

We believe technological change, far from reducing the need for human work, increases it, by broadening the scope of what humans can productively do.

We believe that since human wants and needs are infinite, economic demand is infinite, and job growth can continue forever.

We believe markets are generative, not exploitative; positive sum, not zero sum. Participants in markets build on one another's work and output. James Carse describes finite games and infinite games – finite games have an end, when one person wins and another person loses; infinite games never end, as players collaborate to discover what's possible in the game. Markets are the ultimate infinite game.

The Techno-Capital Machine

Combine technology and markets and you get what Nick Land has termed the techno-capital machine, the engine of perpetual material creation, growth, and abundance.

We believe the techno-capital machine of markets and innovation never ends, but instead spirals continuously upward. Comparative advantage increases specialization and trade. Prices fall, freeing up purchasing power, creating demand. Falling prices benefit everyone who buys goods and services, which is to say everyone. Human wants and needs are endless, and entrepreneurs continuously create new goods and services to satisfy those wants and needs, deploying unlimited numbers of people and machines in the process. This upward spiral has been running for hundreds of years, despite continuous howling from Communists and Luddites. Indeed, as of 2019, before the temporary COVID disruption, the result was the largest number of jobs at the highest wages and the highest levels of material living standards in the history of the planet.

The techno-capital machine makes natural selection work for us in the realm of ideas. The best and most productive ideas win, and are combined and generate even better ideas. Those ideas materialize in the real world as technologically enabled goods and services that never would have emerged de novo.

Ray Kurzweil defines his Law of Accelerating Returns: Technological advances tend to feed on themselves, increasing the rate of further advance.

We believe in accelerationism – the conscious and deliberate propulsion of technological development – to ensure the fulfillment of the Law of Accelerating Returns. To ensure the techno-capital upward spiral continues forever.

We believe the techno-capital machine is not anti-human – in fact, it may be the most pro-human thing there is. It serves us. The techno-capital machine works for us. All the machines work for us.

We believe the cornerstone resources of the techno-capital upward spiral are intelligence and energy – ideas, and the power to make them real.

Intelligence

We believe intelligence is the ultimate engine of progress. Intelligence makes everything better. Smart people and smart societies outperform less smart ones on virtually every metric we can measure. Intelligence is the birthright of humanity; we should expand it as fully and broadly as we possibly can.

We believe intelligence is in an upward spiral – first, as more smart people around the world are recruited into the techno-capital machine; second, as people form symbiotic relationships with machines into new cybernetic systems such as companies and networks; third, as Artificial Intelligence ramps up the capabilities of our machines and ourselves.

We believe we are poised for an intelligence takeoff that will expand our capabilities to unimagined heights.

We believe Artificial Intelligence is our alchemy, our Philosopher's Stone – we are literally making sand think.

We believe Artificial Intelligence is best thought of as a universal problem solver. And we have a lot of problems to solve.

We believe Artificial Intelligence can save lives – if we let it. Medicine, among many other fields, is in the stone age compared to what we can achieve with joined human and machine intelligence working on new cures. There are scores of common causes of death that can be fixed with AI, from car crashes to pandemics to wartime friendly fire.

We believe any deceleration of AI will cost lives. Deaths that were preventable by the AI that was prevented from existing is a form of murder.

We believe in Augmented Intelligence just as much as we believe in Artificial Intelligence. Intelligent machines augment intelligent humans, driving a geometric expansion of what humans can do.

We believe Augmented Intelligence drives marginal productivity which drives wage growth which drives demand which drives the creation of new supply... with no upper bound.

Energy

Energy is life. We take it for granted, but without it, we have darkness, starvation, and pain. With it, we have light, safety, and warmth.

We believe energy should be in an upward spiral. Energy is the foundational engine of our civilization. The more energy we have, the more people we can have, and the better everyone's lives can be. We should raise everyone to the energy consumption level we have, then increase our energy 1,000x, then raise everyone else's energy 1,000x as well.

The current gap in per-capita energy use between the smaller developed world and larger developing world is enormous. That gap will close – either by massively expanding energy production, making everyone better off, or by massively reducing energy production, making everyone worse off.

We believe energy need not expand to the detriment of the natural environment. We have the silver bullet for virtually unlimited zero-emissions energy today – nuclear fission. In 1973, President Richard Nixon called for Project Independence, the construction of 1,000 nuclear power plants by the year 2000, to achieve complete US energy independence. Nixon was right; we didn't build the plants then, but we can now, anytime we decide we want to.

Atomic Energy Commissioner Thomas Murray said in 1953: "For years the splitting atom, packaged in weapons, has been our main shield against the barbarians. Now, in addition, it is a God-given instrument to do the constructive work of mankind." Murray was right too.

We believe a second energy silver bullet is coming – nuclear fusion. We should build that as well. The same bad ideas that effectively outlawed fission are going to try to outlaw fusion. We should not let them.

We believe there is no inherent conflict between the techno-capital machine and the natural environment. Per-capita US carbon emissions are lower now than they were 100 years ago, even without nuclear power.

We believe technology is the solution to environmental degradation and crisis. A technologically advanced society improves the natural environment, a technologically stagnant society ruins it. If you want to see environmental devastation, visit a former Communist country. The socialist USSR was far worse for the natural environment than the capitalist US. Google the Aral Sea.

We believe a technologically stagnant society has limited energy at the cost of environmental ruin; a technologically advanced society has unlimited clean energy for everyone.

Abundance

We believe we should place intelligence and energy in a positive feedback loop, and drive them both to infinity.

We believe we should use the feedback loop of intelligence and energy to make everything we want and need abundant.

We believe the measure of abundance is falling prices. Every time a price falls, the universe of people who buy it get a raise in buying power, which is the same as a raise in income. If a lot of goods and services drop in price, the result is an upward explosion of buying power, real income, and quality of life.

We believe that if we make both intelligence and energy "too cheap to meter", the ultimate result will be that all physical goods become as cheap as pencils. Pencils are actually quite

technologically complex and difficult to manufacture, and yet nobody gets mad if you borrow a pencil and fail to return it. We should make the same true of all physical goods.

We believe we should push to drop prices across the economy through the application of technology until as many prices are effectively zero as possible, driving income levels and quality of life into the stratosphere.

We believe Andy Warhol was right when he said, “What’s great about this country is America started the tradition where the richest consumers buy essentially the same things as the poorest. You can be watching TV and see Coca-Cola, and you can know that the President drinks Coke, Liz Taylor drinks Coke, and just think, you can drink Coke, too. A Coke is a Coke and no amount of money can get you a better Coke than the one the bum on the corner is drinking. All the Cokes are the same and all the Cokes are good.” Same for the browser, the smartphone, the chatbot.

We believe that technology ultimately drives the world to what Buckminster Fuller called “ephemeralization” – what economists call “dematerialization”. Fuller: “Technology lets you do more and more with less and less until eventually you can do everything with nothing.”

We believe technological progress therefore leads to material abundance for everyone.

We believe the ultimate payoff from technological abundance can be a massive expansion in what Julian Simon called “the ultimate resource” – people.

We believe, as Simon did, that people are the ultimate resource – with more people come more creativity, more new ideas, and more technological progress.

We believe material abundance therefore ultimately means more people – a lot more people – which in turn leads to more abundance.

We believe our planet is dramatically underpopulated, compared to the population we could have with abundant intelligence, energy, and material goods.

We believe the global population can quite easily expand to 50 billion people or more, and then far beyond that as we ultimately settle other planets.

We believe that out of all of these people will come scientists, technologists, artists, and visionaries beyond our wildest dreams.

We believe the ultimate mission of technology is to advance life both on Earth and in the stars.

Not Utopia, But Close Enough

However, we are not Utopians.

We are adherents to what Thomas Sowell calls the Constrained Vision.

We believe the Constrained Vision – contra the Unconstrained Vision of Utopia, Communism, and Expertise – means taking people as they are, testing ideas empirically, and liberating people to make their own choices.

We believe in not Utopia, but also not Apocalypse.

We believe change only happens on the margin – but a lot of change across a very large margin can lead to big outcomes.

While not Utopian, we believe in what Brad DeLong terms “slouching toward Utopia” – doing the best fallen humanity can do, making things better as we go.

Becoming Technological Supermen

We believe that advancing technology is one of the most virtuous things that we can do.

We believe in deliberately and systematically transforming ourselves into the kind of people who can advance technology.

We believe this certainly means technical education, but it also means going hands on, gaining practical skills, working within and leading teams – aspiring to build something greater than oneself, aspiring to work with others to build something greater as a group.

We believe the natural human drive to make things, to gain territory, to explore the unknown can be channeled productively into building technology.

We believe that while the physical frontier, at least here on Earth, is closed, the technological frontier is wide open.

We believe in exploring and claiming the technological frontier.

We believe in the romance of technology, of industry. The eros of the train, the car, the electric light, the skyscraper. And the microchip, the neural network, the rocket, the split atom.

We believe in adventure. Undertaking the Hero's Journey, rebelling against the status quo, mapping uncharted territory, conquering dragons, and bringing home the spoils for our community.

To paraphrase a manifesto of a different time and place: “Beauty exists only in struggle. There is no masterpiece that has not an aggressive character. Technology must be a violent assault on the forces of the unknown, to force them to bow before man.”

We believe that we are, have been, and will always be the masters of technology, not mastered by technology. Victim mentality is a curse in every domain of life, including in our relationship with technology – both unnecessary and self-defeating. We are not victims, we are conquerors.

We believe in nature, but we also believe in overcoming nature. We are not primitives, cowering in fear of the lightning bolt. We are the apex predator; the lightning works for us.

We believe in greatness. We admire the great technologists and industrialists who came before us, and we aspire to make them proud of us today.

And we believe in humanity – individually and collectively.

Technological Values

We believe in ambition, aggression, persistence, relentlessness – strength.

We believe in merit and achievement.

We believe in bravery, in courage.

We believe in pride, confidence, and self respect – when earned.

We believe in free thought, free speech, and free inquiry.

We believe in the actual Scientific Method and enlightenment values of free discourse and challenging the authority of experts.

We believe, as Richard Feynman said, “Science is the belief in the ignorance of experts.”

And, “I would rather have questions that can’t be answered than answers that can’t be questioned.”

We believe in local knowledge, the people with actual information making decisions, not in playing God.

We believe in embracing variance, in increasing interestingness.

We believe in risk, in leaps into the unknown.

We believe in agency, in individualism.

We believe in radical competence.

We believe in an absolute rejection of resentment. As Carrie Fisher said, “Resentment is like drinking poison and waiting for the other person to die.” We take responsibility and we overcome.

We believe in competition, because we believe in evolution.

We believe in evolution, because we believe in life.

We believe in the truth.

We believe rich is better than poor, cheap is better than expensive, and abundant is better than scarce.

We believe in making everyone rich, everything cheap, and everything abundant.

We believe extrinsic motivations – wealth, fame, revenge – are fine as far as they go. But we believe intrinsic motivations – the satisfaction of building something new, the camaraderie of being on a team, the achievement of becoming a better version of oneself – are more fulfilling and more lasting.

We believe in what the Greeks called eudaimonia through arete – flourishing through excellence.

We believe technology is universalist. Technology doesn't care about your ethnicity, race, religion, national origin, gender, sexuality, political views, height, weight, hair or lack thereof. Technology is built by a virtual United Nations of talent from all over the world. Anyone with a positive attitude and a cheap laptop can contribute. Technology is the ultimate open society.

We believe in the Silicon Valley code of “pay it forward”, trust via aligned incentives, generosity of spirit to help one another learn and grow.

We believe America and her allies should be strong and not weak. We believe national strength of liberal democracies flows from economic strength (financial power), cultural strength (soft power), and military strength (hard power). Economic, cultural, and military strength flow from technological strength. A technologically strong America is a force for good in a dangerous world. Technologically strong liberal democracies safeguard liberty and peace. Technologically weak liberal democracies lose to their autocratic rivals, making everyone worse off.

We believe technology makes greatness more possible and more likely.

We believe in fulfilling our potential, becoming fully human – for ourselves, our communities, and our society.

The Meaning of Life

Techno-Optimism is a material philosophy, not a political philosophy.

We are not necessarily left wing, although some of us are.

We are not necessarily right wing, although some of us are.

We are materially focused, for a reason – to open the aperture on how we may choose to live amid material abundance.

A common critique of technology is that it removes choice from our lives as machines make decisions for us. This is undoubtedly true, yet more than offset by the freedom to create our lives that flows from the material abundance created by our use of machines.

Material abundance from markets and technology opens the space for religion, for politics, and for choices of how to live, socially and individually.

We believe technology is liberatory. Liberatory of human potential. Liberatory of the human soul, the human spirit. Expanding what it can mean to be free, to be fulfilled, to be alive.

We believe technology opens the space of what it can mean to be human.

The Enemy

We have enemies.

Our enemies are not bad people – but rather bad ideas.

Our present society has been subjected to a mass demoralization campaign for six decades – against technology and against life – under varying names like “existential risk”, “sustainability”, “ESG”, “Sustainable Development Goals”, “social responsibility”, “stakeholder capitalism”, “Precautionary Principle”, “trust and safety”, “tech ethics”, “risk management”, “de-growth”, “the limits of growth”.

This demoralization campaign is based on bad ideas of the past – zombie ideas, many derived from Communism, disastrous then and now – that have refused to die.

Our enemy is stagnation.

Our enemy is anti-merit, anti-ambition, anti-striving, anti-achievement, anti-greatness.

Our enemy is statism, authoritarianism, collectivism, central planning, socialism.

Our enemy is bureaucracy, vetocracy, gerontocracy, blind deference to tradition.

Our enemy is corruption, regulatory capture, monopolies, cartels.

Our enemy is institutions that in their youth were vital and energetic and truth-seeking, but are now compromised and corroded and collapsing – blocking progress in increasingly desperate bids for continued relevance, frantically trying to justify their ongoing funding despite spiraling dysfunction and escalating ineptness.

Our enemy is the ivory tower, the know-it-all credentialed expert worldview, indulging in abstract theories, luxury beliefs, social engineering, disconnected from the real world, delusional, unelected, and unaccountable – playing God with everyone else’s lives, with total insulation from the consequences.

Our enemy is speech control and thought control – the increasing use, in plain sight, of George Orwell’s “1984” as an instruction manual.

Our enemy is Thomas Sowell’s Unconstrained Vision, Alexander Kojeve’s Universal and Homogeneous State, Thomas More’s Utopia.

Our enemy is the Precautionary Principle, which would have prevented virtually all progress since man first harnessed fire. The Precautionary Principle was invented to prevent the large-scale deployment of civilian nuclear power, perhaps the most catastrophic mistake in Western society in my lifetime. The Precautionary Principle continues to inflict enormous

unnecessary suffering on our world today. It is deeply immoral, and we must jettison it with extreme prejudice.

Our enemy is deceleration, de-growth, depopulation – the nihilistic wish, so trendy among our elites, for fewer people, less energy, and more suffering and death.

Our enemy is Friedrich Nietzsche's Last Man:

I tell you: one must still have chaos in oneself, to give birth to a dancing star. I tell you: you have still chaos in yourselves.

Alas! There comes the time when man will no longer give birth to any star. Alas! There comes the time of the most despicable man, who can no longer despise himself...

"What is love? What is creation? What is longing? What is a star?" — so asks the Last Man, and blinks.

The earth has become small, and on it hops the Last Man, who makes everything small. His species is ineradicable as the flea; the Last Man lives longest...

One still works, for work is a pastime. But one is careful lest the pastime should hurt one.

One no longer becomes poor or rich; both are too burdensome...

No shepherd, and one herd! Everyone wants the same; everyone is the same: he who feels differently goes voluntarily into the madhouse.

"Formerly all the world was insane," — say the subtlest of them, and they blink.

They are clever and know all that has happened: so there is no end to their derision...

"We have discovered happiness," — say the Last Men, and they blink.

Our enemy is... that.

We aspire to be... not that.

We will explain to people captured by these zombie ideas that their fears are unwarranted and the future is bright.

We believe these captured people are suffering from resentment – a witches' brew of resentment, bitterness, and rage that is causing them to hold mistaken values, values that are damaging to both themselves and the people they care about.

We believe we must help them find their way out of their self-imposed labyrinth of pain.

We invite everyone to join us in Techno-Optimism.

The water is warm.

Become our allies in the pursuit of technology, abundance, and life.

The Future

Where did we come from?

Our civilization was built on a spirit of discovery, of exploration, of industrialization.

Where are we going?

What world are we building for our children and their children, and their children?

A world of fear, guilt, and resentment?

Or a world of ambition, abundance, and adventure?

We believe in the words of David Deutsch: "We have a duty to be optimistic. Because the future is open, not predetermined and therefore cannot just be accepted: we are all responsible for what it holds. Thus it is our duty to fight for a better world."

We owe the past, and the future.

It's time to be a Techno-Optimist.

It's time to build.