
A STRATEGIC FORESIGHT LIBRARY

Strategic Foresight is the organizational ability to successfully anticipate, analyze, and prepare for the future consequences of decisions made in a complex and uncertain environment. DTRA is committed to the delegation of necessary and appropriate decision-making authority to the lowest competent organizational level. This translates to the exercise of multi-disciplinary leadership (military, civilian, professional, and administrative) on a decentralized functional basis. Effective leaders at all levels of responsibility should understand the potential effects related to, and minimize the risk of unanticipated consequences arising from, those decisions (while concurrently seeking to reduce the response time to the inevitable unexpected contingency). Failure to adequately consider relevant long-range thinking presents an unacceptable risk of catastrophic technological and strategic surprise.

The following reading list serves as an intellectual toolbox to assist in the thoughtful execution of this foundational responsibility. Divided into categories of interest, it covers a variety of mission-related strategic perspectives and evolving challenges. Short content summaries are provided to help determine the level of interest and relevance to specific concerns addressed by these reference works.

The Uses of Historical Analysis in Anticipating Future Challenges

Winston Churchill once said, “The farther back you can look, the farther ahead you’re likely to see.” These works present perspectives on identifying and applying mission-relevant historical lessons taught, and avoiding the mistakes of the past.

Thinking in Time: The Uses of History for Decision Makers (Neustadt and May, 1988)

A seminal work by two Harvard/Kennedy School of Government professors that urges leaders to understand time as a stream which has neither pre-ordained path nor outcome, subject to a near infinite series of variables. Rather than an immutable destiny, the authors see influence on the future exerted by the interaction of shifting considerations at critical moments. To them, the real talent lies in achieving the greatest effect with the exercise of the least amount of state power. Particularly compelling is their analysis of General George Marshall’s 1942 vision of post-World War II Europe that formed the early basis for the Marshall Plan.

The Collapse of the Third Republic: An Inquiry into the Fall of France (William L. Shirer, 1969)

Considered by many to be the greatest work by the renowned author of *The Rise and Fall of the Third Reich*. The story is one of how a sclerotic national military and a politically unaccountable

bureaucracy directly contributed to the humiliating defeat of France by a numerically and technologically inferior Germany. The lessons taught remain as relevant today as in 1940.

Empire: The Rise and Demise of the British World Order and the Lessons for Global Power (Niall Ferguson, 2004)

Examines the opportunities and costs incurred of the British Imperium and the decisions that caused the eventual collapse of an empire that, at one point, governed over a quarter of the world's population. Ferguson, a Fellow at Stanford's Hoover Institution and on the faculties of Oxford and Harvard, is a Scottish historian with a background in economics. He skillfully details the ruinous institutional and financial costs of the empire while outlining ways in which the British Empire's inheritors and successors (especially the United States) can avoid them.

The Fourth Turning (Neil Howe and William Strauss, 1997)

The latest interpretation of Gibbons/Kondratieff/Elliott Wave Theory that resurfaces periodically among academicians. In the tradition of Gibbons' *Decline and Fall of the Roman Empire*, Howe and Strauss contend that history moves in broadly predictable cycles based upon human nature and associated generational responses to socio-economic developments. These actions manifest in chronological "Waves" that exhibit specific characteristics, allowing foresight into how societies are likely to react to certain challenges and opportunities. Wave Theory is a combination of historical analysis, mass psychology, and market theory that had a broad spectrum of adherents in the 20th century (Kondratieff was Stalin's chief Soviet economist, Elliott a Wall Street accountant). It remains poorly understood but exhibits a continuing appeal to tin-foil hat wearers and Nobel Prize winners alike. What cannot be so readily dismissed are the undeniable operations of the forces of history on the future, and for that reason alone this book remains a well-written source of insight to senior decision-makers.

The Structure of Scientific Revolution (Thomas Kuhn, 1962)

The work that coined the phrase "paradigm shift" in describing the growth of technical and scientific knowledge. Kuhn, both a physicist and philosopher, argued that the growth of scientific knowledge is rarely slow and evolutionary, instead characterized by sporadic radical leaps in understanding interspersed among lengthy periods of little or no advancement of fundamental thought. This interpretation stands in opposition to the school of incremental scientific and technological growth trends recently represented by "Moore's Law."

Structured Thinking on the Future: The Discipline of Strategic Foresight

The Third Wave (Alvin & Heidi Toffler, 1984)

Written by husband and wife co-founders of the World Future Society and long-time consultants to DTRA's legacy organizations. Part of a four book series written over 40 years, Toffler's analysis identified several key trends that continue to shape the evolving 21st century global community, including the transitions from industrial to information-based economies, from standardized "one size fits all" education to more personalized programs, and the post-Modern rise of non-state alternatives to traditional nation-state models. The Toffler approach continues to influence DTRA today—the Toffler Associates Futuring Firm (founded in 1994) advises the JIDO J5 on an on-going basis to identify key mission-critical disruptive technologies.

The Next 100 Years (George Friedman, 2009)

A study of critical geopolitical trends and evolving disruptive technologies shaping the 21st century by the founder of the private intelligence and forecasting firms STRATFOR and Geopolitical Futures. Friedman's approach downplays the importance of individual leadership personalities and instead focuses on the primary motivations of political, cultural, and economic self-interest as applied to both state and non-state actors. In his vision of the 21st century, the most dangerous actor is the one so out-manuevered by adversaries that it has nothing left to lose by acting with reckless disregard of the consequences. Dr. Friedman has advised DTRA on strategic foresight matters over the past decade.

Futuring: The Exploration of the Future (Edward Cornish, 2005)

An analysis of early trend identification methodologies by one of the co-founders (and long-time president) of the World Future Society. He was a collaborator with Nobel Prize winning physicist Dr. Glenn Seaborg on the formation of the Atomic Energy Commission and served as a consultant to the successor Nuclear Regulatory Commission.

Foresight, Innovation & Strategy – Essays on the Fortieth Anniversary of the Founding of the World Future Society (Cynthia Wagner, Editor-2006)

A collection of papers presented by various forecasters, futurists, and foresight practitioners sponsored by those present at the 1966 establishment of the World Future Society. Especially valuable are both the perspectives on the lessons learned from the transition of strategic foresight practice from narrative speculation to academic discipline and the interrelationship of foresight practice to strategy development and implementation.

The Art of the Long View: Planning for the Future in an Uncertain World (Peter Schwartz, 1996)

Peter Schwartz outlines the "strategic scenario" approach, giving you the tools for developing a strategic vision within your business. Schwartz describes the narrative-based technique, originally developed within Royal Dutch Shell, based on many of his firsthand scenario exercises with the world's leading institutions and companies, including the White House, EPA, BellSouth, PG&E, and the International Stock Exchange.

Critical Thinking

Thinking, Fast and Slow (Daniel Kahneman, 2013)

Daniel Kahneman, the renowned psychologist and winner of the Nobel Prize in Economics, takes us on a groundbreaking tour of the mind and explains the two systems that drive the way we think. System 1 is fast, intuitive, and emotional; System 2 is slower, more deliberative, and more logical. The impact of overconfidence on corporate strategies, the difficulties of predicting what will make us happy in the future, the profound effect of cognitive biases on everything from playing the stock market to planning our next vacation—each of these can be understood only by knowing how the two systems shape our judgments and decisions.

Engaging the reader in a lively conversation about how we think, Kahneman reveals where we can and cannot trust our intuitions and how we can tap into the benefits of slow thinking. He offers practical and enlightening insights into how choices are made in both our business and our personal lives—and how we can use different techniques to guard against the mental glitches that often get us into trouble.

Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets (Nassim Taleb, 2005)

Fooled by Randomness is a standalone book in Nassim Nicholas Taleb's landmark *Incerto* series, an investigation of opacity, luck, uncertainty, probability, human error, risk, and decision-making in a world we do not understand.

Models. Behaving. Badly.: Why Confusing Illusion with Reality Can Lead to Disaster, On Wall Street and in Life (Emanuel Derman, 2012)

Quants (physicists working on Wall Street as quantitative analysts) have been widely blamed for triggering financial crises with their complex mathematical models. Their formulas were meant to allow Wall Street to prosper without risk. But in this penetrating insider's look at the 2007-2009 economic collapse, Emanuel Derman—former head quant at Goldman Sachs—explains the collision between mathematical modeling and economics and what makes financial models so dangerous. Though such models imitate the style of physics and employ the language of

mathematics, theories in physics aim for a description of reality—but in finance, models can achieve only a very limited approximation of reality. Derman uses his firsthand experience in financial theory and practice to explain the complicated tangles that continue to stymie economic stability. *Models. Behaving. Badly.* fully analyzes the financial community’s continued infatuation with complex models, and shows us why nobody will ever be able to write a model that can effectively encapsulate human behavior.

Complexity, Risk, and Resiliency in Future Operating Environments

The Collapse of Complex Societies (Joseph Tainter, 1990)

Examines how accumulating vulnerabilities can, over time, overcome the most prudent systemic risk mitigation strategies. Tainter is a Utah State University anthropologist and historian who argues that complex societies rarely fail through sudden unanticipated catastrophe, but are instead pulverized by a lengthy process of accumulating crises and consequences arising from unaddressed long-standing systemic deficiencies.

The Black Swan, 2nd Edition (Nassim Taleb, 2010)

A modern classic by one of the acknowledged intellectual leaders in the development of complex systemic risk identification, analysis, and mitigation theory. Taleb adopts a “system of systems” theory approach (recognizable to both systems engineers and operations analysts) to risk that emphasizes safeguard redundancy, institutional resiliency, and recognition of a broad spectrum of potentially devastating (even if seemingly unlikely—hence the title) factors that can adversely affect the most thoughtful organization. Make sure that you consult the second edition released in 2010, which includes extended conceptual considerations of environmental complexity, organizational robustness, and the resiliency-associated concept of “anti-fragility.”

The Logic of Failure: Recognizing and Avoiding Error in Complex Situations (Dietrich Dörner, 1997)

Why do we make mistakes? Are there certain errors common to failure, whether in a complex enterprise or daily life? Dörner identifies what he calls the “logic of failure”—certain tendencies in our patterns of thought that, while appropriate to an older, simpler world, prove disastrous for the complex world we live in now. Working with imaginative and often hilarious computer simulations, he analyzes the roots of catastrophe, showing city planners in the very act of creating gridlock and disaster, or public health authorities setting the scene for starvation. *The Logic of Failure* is a compass for intelligent planning and decision-making that can sharpen the skills of managers, policymakers, and everyone involved in the daily challenge of getting from point A to point B.

Making Things Work: Solving Complex Problems in a Complex World (Yaneer Bar-Yam, 1994)

Today, as individuals and as a society, we are faced with highly complex challenges. When we don't solve them correctly they rapidly become crises. Highly complex problems cannot be solved by any one individual. Bar-Yam argues that, in the current evolving business and social environment, traditional organizations relying on traditional forms of control and planning are no longer the predominant model of functional effectiveness. This study draws on insights from complex systems research about emergence, complexity, patterns, networks, and evolution. It explains how effective organizations form through cooperation and competition, and how to make non-hierarchical distributed organizational structures effective at their tasks.

X Events: The Collapse of Everything (John Casti, 2012)

A study on the anticipation of, and recovery from, the consequences of extreme disruptive events affecting increasingly complex and technologically dependent human society. Chair of the International Institute for Applied Systems Analysis and formerly with the RAND Corporation and Princeton University, Casti has been recommended by Nassim Taleb as “one of the finest contemporary experts on complex systems theory.”

Anticipatory “Low Probability, High Consequence” Event Contingency Planning

Worst Case Scenarios (Cass Sunstein, 2007)

A public sector focused analysis on approaching “Black Swan”-type catastrophic risk. Written by the Obama administration’s former “Czar” of regulatory reform (who proposed raising FEMA to cabinet-level status), the Sunstein approach tries to steer a middle course between the panic that characterized national Civil Defense efforts of the 1950’s and the apathy of post-ABM treaty national missile defense policies of the 1970’s. He proposes adoption of a “Catastrophic Harm Precautionary Principle,” which prioritizes the value of addressing both the magnitude and probability of a potential harm. Under his view, cost considerations assume a subsidiary role.

Catastrophe-Risk and Response (Richard Posner, 2004)

An alternative approach by a longtime federal jurist acknowledged as the Father of Modern Antitrust Law. Judge Posner recognizes that both public and private sector catastrophic contingency risk management in a time of fiscal constraint requires prioritizing considerations of economic efficiency. Under this approach, a utilitarian “cost benefit analysis” predominantly governs the allocation of scarce resources against competing prospects of catastrophic risk. Ultimate benefit is defined as the investment that achieves the quickest restoration of the greatest extent of effective post-catastrophe societal functions. The choices required and the costs

incurred in achieving that resultant utilitarian benefit (the best result for the most beneficiaries) are likely to be cross-generational.

Antifragile: Things that Gain from Disorder (Nassim Taleb, 2014)

Antifragile is a standalone book in Nassim Nicholas Taleb's landmark *Incerto* series, an investigation of opacity, luck, uncertainty, probability, human error, risk, and decision-making in a world that we often do not understand. Just as human bones get stronger when subjected to stress and tension, and rumors or riots intensify when someone tries to repress them, many things in life benefit from stress, disorder, volatility, and turmoil. What Taleb has identified and calls "antifragile" is that category of things that not only gain from chaos but need it in order to survive and flourish.

Old Adversaries, New Challenges

Asian Countries and the Arctic Future (Lunde, Jian, Stensdahl, 2015)

Explores the rising importance of a potentially permanently navigable Arctic and finds new challenges to U.S. naval interests from an unlikely source. China, India, Japan, Singapore, and South Korea have all become permanent observers to the Arctic Council, and bring with them sharply differing national security and commercial interests. The rise of a new class of "Blue Water" maritime powers (with conflicting approaches on adherence to the Law of the Sea) threatens to make the "High North" a renewed area of instability after a relatively quiet quarter century.

The Hundred Year Marathon: China's Secret Strategy (Michael Pillsbury, 2016)

An exploration of People's Republic of China (PRC) geopolitical goals as it seeks to attain pre-eminent Great Power status, with a publicly stated strategic aim of supplanting the United States by the 100th Anniversary of the PRC's founding. Currently Director of the Hudson Institute's Center on Chinese Strategy and formerly with both RAND and the Defense Department, Pillsbury argues that China seeks to achieve this goal preferably through economic power and diplomatic means, but is nonetheless prepared to employ military force if necessary. He also emphasizes that a sizeable (and growing) portion of the PRC's military leadership sees this necessity as inevitable.

China's Evolving Military Strategy (Joe McReynolds, Editor, 2016)

An in-depth analysis offering expert assessments of current trends in PRC military thought. Traditional air, land, and sea battlespace strategy and doctrine is analyzed, and the fundamental importance the Chinese military affords asymmetrical capabilities in cyber, space, and electronic

spectrum warfare is also given detailed consideration. McReynolds is the China Security Studies Fellow at Jamestown Institute.

No Illusions: The Voices of Russia's Future Leaders (Ellen Mickiewicz, 2017)

A collection of interviews with 108 of the most promising recent graduates (both military and civilian) from three of Russia's most prestigious universities. The most readily identifiable recurring theme among these future governing elites is the overpowering sense of distrust they have for each other and the world (especially, but in no particular order, their neighbors to the West, the People's Republic of China, and the United States). They also share an abiding faith in the weaponization of information and cyber technology as a means of equalizing the advantages of larger and richer adversaries. Dr. Mickiewicz, a longtime specialist in Russian culture and politics at Duke University, has produced an illuminating, but equally saddening portrait of the Russian state's prospective future leadership.

The Changing Face of War

Another Bloody Century: Future Warfare (Colin Gray, 2007)

A collection of essays on the future prospects for, and character of, military conflict in the coming decades. A Visiting Fellow and constant presence on the National Defense University and National War College faculties, Gray (also the author of another recommended work, *The Future of Strategy*, 2015), in the words of Secretary Mattis, "stands alone in clarity and strategic insight."

Future War: Preparing for the New Global Battlefield (Robert Latiff, 2017)

Analyzes the accelerating pace of military technological developments and the inability of both law and doctrine to integrate those advanced capabilities into national defense strategy in either a coherent or ethical manner. His warnings echo the "Singularity" concerns of both Verner Vinge and Ray Kurzweill. Latiff is a retired Air Force Major General, dividing his time between teaching ethics at Notre Dame and serving as Director of Intelligence Community Programs at George Mason University's School of Engineering.

The Future of Violence: Confronting the New Age of Threat (Wittes and Blum, 2016)

Examines the challenges posed by failing restraints on the proliferation of advanced technologies that pose high risk of misuse. Potential threats arising from uncontrolled access to biotechnology, nanotechnology, cyber-technology, and robotics can stress and ultimately overwhelm the traditional national security and law enforcement communities operating in time-honored segregated fashion. Wittes (a Brookings Institute Fellow who also serves as the Editor of *Lawfare*) and Blum (on the faculty of Harvard Law School) argue that the new era of national

security threats, driven by unprecedented widespread access to low cost advanced technologies capable of grave misuse, will require expanded cooperation between intelligence, military, and law enforcement authorities.

America the Vulnerable: The New Threat Matrix of Digital Espionage, Crime, and Warfare (Joel Brenner, 2011)

Brings the perspective of the former National Executive for Counter-Intelligence and Senior Counsel at the National Security Agency to the evolving challenges posed by cyberwarfare, cyber-crime, and cyber-espionage. He specifically highlights threats to national power grids, critical civil and military infrastructure, and weapons systems from compromised components. His recommendations include both high-level legislative suggestions and practical operational risk mitigation approaches focusing on addressing emerging disruptive technological threats.

Ghost Fleet (Singer/Cole, 2016)

An effective imagining of warfare within the foreseeable future employing full use of emerging disruptive technologies by both the United States and its adversaries. Favored speakers at the National War College, DARPA, the World Future Society, and the Army's Mad Scientist Initiative, Singer and Cole have depicted a realistic and unsettling not too distant future.

Evolving Challenges to the Nation-State: The Building Blocks of Global Government in an Era of Disruptive Technologies

Anarchy as Order: Self-regulating Societies vs Imposed Order (Mohammed Bamyeh, 2009)

Challenges the traditional political theory of nation-state dominance and our perception of "Failing States." Bamyeh represents a small but growing segment of "Anarcho-Capitalists." They argue that, in a time of widespread availability of knowledge and cyber technology, the existence of traditional government as a prerequisite for an effective society (particularly a functioning economy) is no longer necessary. This stands directly in opposition to the long-standing Hegellian concept that the effective modern state must have a monopoly on all types of coercive power—economic, political, and military. Adversaries with a minimal command structure or non-recognizable institutions of government require a new definition of warfighting doctrine and deterrence, challenges current global militaries are only begrudgingly starting to address.

Connectography – Mapping the Future of Global Civilization (Parag Khanna, 2016)

Discusses an entire range of evolving trends that are raising fundamental questions about the future of the global community and the very definition of the state (and all that potentially

entails). An essential element of Khanna's argument is that global supply chains are rapidly subsuming, and rendering obsolete, the traditional geographical borders that govern our sense of political and demographic identity. The challenges presented by the future permanent internationalization of economic identity and trade go to the very heart of sovereignty and traditional governmental powers.

Who Owns the Future (Jaron Lanier, 2013)

Explores the concept of "Siren Servers" — the prospect of increasing exploitation of commercial, political, and technological "Big Data" by a decreasing number of monopolistic corporate search engine owners. The potential for harm posed by the increasingly centralized control of access to massive compilations of data and information concerning every aspect of society is unlimited and unconstrained by current law. As depicted in this study, a future shaped and run by Google is not necessarily desirable.

Fewer – How the New Demography of Depopulation will Shape our Future (Ben Wattenberg, 2004)

A work by the longtime PBS interviewer and government official who served in every Presidential Administration from Lyndon Johnson to George W. Bush. In this analysis, he examines the causes and effects of multiple source forecasted demographical trends that will result, by 2100, in a world with markedly fewer and older people. Wattenberg considers the unanticipated consequences of expanding global societal freedom and health care availability—later marriage, higher per capita income, and fewer children are just some of the early signs of the fundamental changes likely to have global impact over the next 80 years. As reductions in population on every continent drive everything from leisure time to the increased adoption of Artificial Intelligence labor replacements to the search for new generations of soldiers, the world will become increasingly unrecognizable.

The Singularity Is Near: When Humans Transcend Biology (Ray Kurzweil, 2005)

The great visionary Ray Kurzweil is one of the most controversial advocates for the role of machines in the future of humanity. In his latest book, he envisions an event—the "singularity"—in which technological change becomes so rapid and so profound that our bodies and brains will merge with our machines.

The *Singularity Is Near* portrays what life will be like after this event—a hybrid human-machine civilization where our wholesale experience shifts from physical perception to virtual reality, where enhanced human intelligence exceeds physiological limitations in both computational power and speed. Along with extraordinary opportunities for advancement, this new era presents seminal challenges to our traditional understanding of what it means to be a human. How will

society and its institutions continue to function when the pace of technological improvement and information growth exceeds our ability to absorb, integrate, and understand it?

Leading Complex Organizations

Future Making: Getting Your Organization Ready for What's Next (Clark Murdock, 2007)

A practical guide to developing organizational strategic foresight capabilities by a recognized national security forecaster at the Center for Strategic and International Studies. Noted for both his foresight process works as well as his studies on long-range alternative national defense and nuclear posture strategies, Murdock outlines decision-making approaches that result in effective future-oriented organizations.

Who Says Elephants Can't Dance?: Inside IBM's Historic Turnaround (Louis V. Gerstner, Jr., 2002)

This is CEO Louis V. Gerstner Jr's memoir about the turnaround of IBM and his transformation of the company into the industry leader of the computer age. When Gerstner became CEO of IBM in 1993, shares were in freefall and the company was on the verge of collapse. Hired for his successful management of RJR Nabisco and American Express, Gerstner had no background in technology, but during his seven-year chairmanship, he transformed the company into the leading force of the computer age. This is a compelling story of how a troubled organization with conflicting legacies rescued itself from near certain collapse. However, the price paid for, and the consequences of, those choices remain controversial.