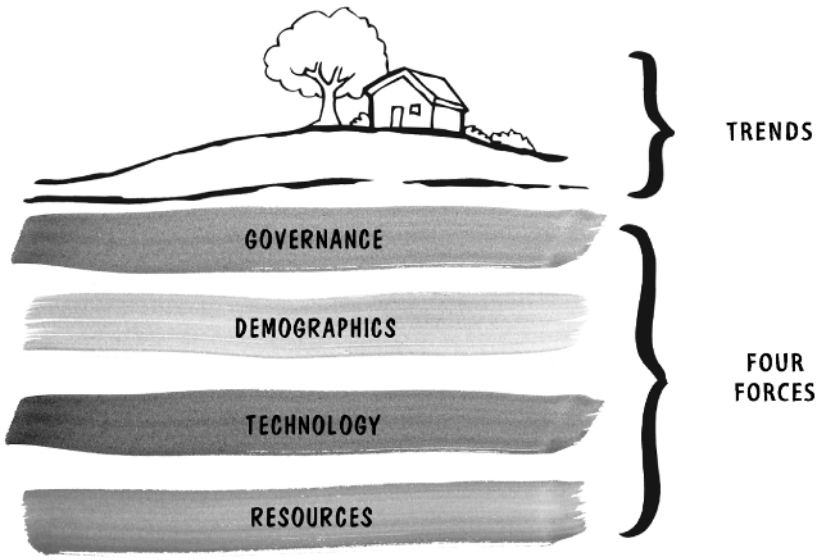
Chapter One

The Four Forces of Change

It is important to remember that the focus of this book is on thinking, not on trends. Certainly, we'll uncover a number of trends here in Part One, but as the Four Forces Model will show, the thinking and process hold up no matter what the trend may be.

Current trends are not the purview of a futurist anyhow. Our concern is with the deep, structural forces that are constant and that cast a longer shadow on the future. In my work as a futurist, I have sought to reduce change to its most elemental components and have come up with the Four Forces Model. Just as hydrogen, nitrogen, carbon, and sulfur are the four building blocks of all life forms, resources, technology, demographics, and governance are the four building blocks of all change. These forces generally move more slowly than trends and have a permanent effect. Because we understand the relationship among the four forces—a relationship we will examine in the following pages—we also understand that the changes they bring about occur in a fairly predictable manner. What we can't predict are their outcomes.



To appreciate how the four forces shape society, it's useful to look at human society *as* it was taking shape, during the time of Neanderthals, fifty thousand years ago. An archetypal depiction of this group usually shows them huddled around a fire, holding spears, either getting ready for or feeding on the results of the day's hunt. The four forces are easily identified in a scene such as this, as everything about their life is in a more elemental form: resources comprise the food and materials that nature offers; technology is represented by the spears; demographic data could be measured on the fingers of just a few members; and governance is inferred from the evidence that they've managed to create a home base that supports a group.

Over time, humans have been able to harness the power of the four forces for their own benefit. In the process, they have moved from a position of hand-to-hand combat with the forces in a battle for survival, to one of greater comfort and ease. We'll explore how the four forces have been the constants in every stage of development and how, with the exception of catastrophic

events, progress has unfolded in an evolutionary manner. Our journey begins, here, with our Neanderthal predecessors.

Resources. Neanderthals spent much of their days hunting and gathering food and collecting materials, such as wood and stone, from their environment to make fire, tools, and rudimentary shelters. Their lives depended on what was readily available (or not) in close proximity. If what was at hand wasn't enough, or if the grass looked as though it would be greener someplace else, then they'd go in search of new hunting and gathering grounds.

Technology. Tools helped Neanderthals get the most out of what the environment had to offer, and transform it into secondary resources. For example, fire could transform a fresh animal into cooked, digestible food; melt hard minerals into new, moldable forms; and convert clay into pots. Each of these secondary materials introduces new capacities—improving food storage and shelter, for example—which build on one another. In this way, technology begets new technologies.

Demographics. Though often no larger than a clan of forty, early societies were also concerned with having the right demographic mix of age, gender, and genetic diversity. This is an important third category of assets, after resources and technology, for who you have on your team is the primary factor in how successful you'll be as a group. Productivity is the key. Whether it's the ability to produce more children or provide more labor, the capacity to enhance the health and wealth of the group relies on who's in the mix.

Governance. Distribution and management of the group's assets—resources, technology, and people—are administered through the rule of law and the rule of markets. Whether it is a clan of forty deciding who does the hunting, who tends the children, or how the meat is distributed, or the communist state of China mandating the distribution of resources, information, and even offspring for its 1.3 billion citizens, every society uses the rule

of law and the rule of markets to adapt to a shifting landscape. And what drives those shifts? Why, resources, technology, and demographics, of course.

■■■

We may have graduated from loincloths to spacesuits and from cave dwellings to smart homes, but there's a whole lot that hasn't changed since prehistoric times. We've gained comfort, convenience, and complexity, but the four forces are still the foundation for life.

There's a hierarchy among the four forces that has also remained constant over time. Because the availability of resources is most closely related to survival, it is the foundation of the system of forces. It is also the slowest moving of the four, sometimes moving at the pace of a glacier, literally. Change in resources is affected by gradual processes—such as evolution, mineral formation, climate change, tectonic shifts—and by human activity. The exception is when, due to these gradual changes, pressure builds, then releases in a sudden eruption or weather system such as a tsunami, earthquake, or hurricane. The utter destruction waged by such events reminds us why resources rank first among the four forces. Resources can pull rank anytime; all it takes is a tsunami or earthquake to remind us which force has the upper hand.

In the hierarchy of forces, technology comes second. The tools and knowledge we use to extract and transform resources into new products and new capacities are what expand our world. Technology also expands human capabilities, giving us power beyond our physical bodies to make things, go places, and discover new realities. Something as simple as magnification in a microscope or telescope opened up an entirely new way of understanding life that shifted beliefs and morality, affected medicine and science, and allowed us to dream about worlds beyond our own.

Knowledge among humans is progressive. Technological innovation builds on what came before it, which explains why the rate

of change in technology accelerates over time, limited only by our capacity to make sense of it. For instance, when stem-cell research and tissue engineering first came on the scene, the consensus reaction was, "Whoa! Wait a minute! What do you mean we can grow organs in the lab? Is this moral? Should it be legal?" So progress has slowed while we try to understand what this new capacity for genetic engineering and regenerative medicine means for our society.

Demographics are next in the four forces lineup. People are producers. We produce through our physical and intellectual labor, and we produce more people. Composition matters, too: you need to have enough working-age people to support the young and the old, and there has to be a balanced ratio of men to women to produce the next generation. Equally important is that a population be bonded to one another, value and reward cooperation, and bear some accountability for the good of the group.

That people can produce more working together than they can working individually is the foundation of social groups, but for social groups to work together successfully, there have to be explicit rules to guide and manage what groups do, how they produce, and how the assets are shared and distributed. This is the role of governance, the last of the four forces.

The first tool of governance is the rule of law, which differentiates between permissible and impermissible actions, determines who has the authority to make the rules, and sets penalties for rule breakers. The second tool of governance is the rule of markets, which rewards a group or individual according to the quantity and quality of items produced.

The structure for maintaining governance is a group's *government,* be it a monarchy, dictatorship, democracy, theocracy, or some other form. Similarly, there are different types of economic systems for managing productivity and rewards, including capitalism, socialism, and communism. No matter what you call it or how

it works, every form of government and economic system sets the rules for its group to follow.

Of all the forces, governance is the most reactive. The rule of law and the rule of markets for a group change in response to resources, technology, and demographics.

To better acquaint you with the four forces, the following four chapters will introduce you to a number of visionary thinkers—some contemporary and some historical—who exemplify the best of future thinking in their "force field."

- *Resources:* Doug Cameron, leading researcher, inventor, and venture capitalist in biofuels technologies
- *Technology:* Iqbal Quadir, founder of Grameenphone and of Emergence Bioenergy, and founder and director of MIT's Legatum Center for Development and Entrepreneurship, which promotes bottom-up entrepreneurship and innovation as a means of achieving economic progress in low-income countries
- *Demographics:* Thomas Malthus, an eighteenth-century political economist who issued a surprising warning—that the planet could reach and exceed population capacity; Auguste Comte, a nineteenth-century French philosopher who coined the phrase "Demography is destiny"; and David E. Bloom, a Harvard economist whose "demographic dividend" concept was featured in *Time* magazine's "Ten Ideas That Will Change the World" in 2011
- *Governance:* Clyde Prestowitz, president of the Economic Strategy Institute, formerly a U.S. trade negotiator and currently an adviser to the White House, global corporations, labor unions, and governments around the world on globalization and competitiveness

Together, their stories will illustrate how the social, economic, and environmental issues of our time spring from these four

constant and predictable forces that structure our world. Understand how they work together to drive change, and you'll be able not only to avert crises but also to uncover ideas and opportunities for *your* future along the way. Signs of emerging ideas, technologies, and markets that you note and collect then become invaluable fodder for the right-brain innovation process you will learn in Part Two.