



## Chapter 5.

# How to be Your Own Futurist — Without Getting Lost in The Ozone

*What is is the was of what shall be.*

- Lao Tzu  
“The Way of Life”

### **The Future: Gee Whiz or Gee Won't?**

The present always makes more sense than it did when it was the future.

Thinking about the future is one of the most peculiar mental activities a person can pursue. And trying to guess the impact of future developments on the success of one's business is even more peculiar. It seems to me that any businesslike exploration of the future requires a certain level of discipline, a commitment to intellectual honesty, and a large measure of humility. Consequently, we should devote careful thought at the outset to the thinking process itself.

What does it mean to think futuristically? Does it mean you're more creative or imaginative than anyone else? Does it mean you can conjure up more fantastic possibilities than anyone else? That you're more optimistic? Or that you can extrapolate current trends further? How does a person think *usefully* about the future?

The first fact we have to face is that, not only can we not predict the future, we can't even come close. It's true that both Leonardo da Vinci and Jules Verne imagined airplanes and submarines. But aside from the inspired guesses of artists and writers, the track record of prognosticators is not very impressive. Having a wild idea is one thing, and discerning the means and the timetable by which it becomes a reality is quite another. Most of the significant technological, social, and political developments of our time have appeared with little fanfare and grew to become major factors in our lives. Most often, we have perceived them only when they have become

obvious.

The second peculiar fact we have to face is that one can make equally good cases for an optimistic view of the future and a pessimistic view. Some futurists write articles about how we'll colonize the moon, conquer all known diseases, and fly around in our little air cars over cities that sparkle with unimaginable beauty. Others write about the depletion of oil reserves, the destruction of rain forests and wetlands, the falling of water tables and the coming of international water politics, and the decimation of populations by AIDS and other viruses yet to be discovered.

Presumably we'll all be driving economical, non-polluting electric vehicles someday soon. Meanwhile, 45,000 Americans die in traffic accidents each year. How do we get from here to there?

Presumably we'll eradicate poverty, illiteracy, violence against women, and abuse of children. Meanwhile, we have over one billion people on the planet who cannot read or sign their names. How do we get from the mundane present to the glorious future?

Presumably we'll all sit at computers and communicate all around the world via the Internet. Meanwhile, half the world's people have no access to electricity or running water. How do we get them on line?

Expert estimates of the speed with which new technologies are put to practical use are almost uniformly optimistic. It took 1500 years for the crossbow to move from China to Europe. The contact lens was invented in 1877 by a German glassmaker, but didn't become generally accepted until the 1950s.

Estimates of the speed of social change are usually even more off base. The fall of communism in the USSR led to predictions of a new golden age of freedom and prosperity for all of the former client republics, and particularly for Russia. Yet, ten years after the start of the much praised *perestroika* — reconstruction — Russia was mired in a worse state of economic ruin and social distress than ever before. Criminal factions, not the free enterprise system, took over the Russian economy, and it is commonly believed that Russia will struggle for at least another decade before climbing onto any kind of significant growth trajectory.

Fidel Castro's Cuba was supposed to become the next casualty of the worldwide decrepitude of communism, presumably embracing a capitalist theory right on the heels of Russian reconstruction. That did not happen.

The new brand of Chinese capitalism heralded by Deng Xiao Ping's rise to power was supposed to create mind-boggling opportunities for Western companies who had goods to sell there. The reality was a peculiar brand of "communistic capitalism" that dangled big promises in front of foreign marketing delegations while demanding control of the capital structures and even ownership of the imported technology. Many firms learned the hard way that Chinese capitalism was an economic model that served the aims of the Party.

In the world of digital technology, the stunning popularity of the Internet and particularly the World Wide Web led to breathless predictions of wonders to come “by the year 2000.” Consumer marketing would be revolutionized, small firms would have the same competitive power as large firms, and every small business would prosper with the magical new strategic weapon called the Web site. As discussed in more detail in a later chapter, the reality was that the Internet quickly became a cesspool of polluted information, a sort of digital “citizen’s band” radio, and a social Petri dish. Established firms that were already successful in conventional marketing began using on-line systems to strengthen their interfaces to their customers, but the expected consumer stampede to the Internet never happened.

If you’re going to be your own futurist, you can choose from three main options. Option one is the “gee-whiz” futurist, the one who loves to sketch out the exciting view of wonderful things to come. The other extreme is the “gee-won’t” futurist, or the gloomster who prefers the pessimistic scenario of ecological decline, overpopulation, famine, pestilence, social disintegration, and resource depletion.

The third option, which I prefer, is the “issue” futurist, who simply uses the discipline and methods of careful cause-and-effect thinking to try to answer relatively narrow questions.

Some time ago, I decided that studying “the future” is largely a waste of time. It’s like studying life. The subject is simply too vast and too multifarious to be approached as a whole. Organizations like the World Future Society<sup>1</sup> and others, while helpful and well-motivated, tend to struggle constantly for perspective. Not wanting to exclude anyone with any kind of interest or orientation at all, they are forced to advocate a loose and multifarious agenda. Organizations like the WorldWatch Institute<sup>2</sup> have adopted a tighter, more political focus, but still suffer from marginalization in a society that perceives ecological specialists as one-note musicians.

The issue futurist makes no attempt to tackle the future in general. That is the occupation of gee-whiz futurists and gee-won’t futurists. The issue futurist poses a question, such as “How will population demographics likely influence the costs of healthcare over the next decade?” and looks for the cause-and-effect chains of events and forces that can illuminate the inquiry.

The phrasing of the question is all-important, because it strongly influences the nature of the inquiry. It makes less sense to ask questions like “What will clothing fashions look like ten years from now?” and more sense to ask questions like “What segments of the population will be spending the most on clothing ten years from now?” and “Which fashion designers will probably have the longest-term effect on clothing styles?”

It makes less sense to ask questions like “How will the Internet affect public education over the next five years?” and more sense to ask questions like “Who will be the most influential stakeholders in the design of the education system?” and “What are the economic mechanisms that will drive the investment in digital

technology for education?” We are much more likely to come up with a useful projection, however imperfect, by asking a set of issue-specific questions rather than one broad, general question.

Our approach in this book will not be to try to “gee-whiz” the future, or to project any kind of comprehensive view of the future. I’ve already declared that I believe that to be a useless, though noble and engrossing, endeavor. What we can do, however, is develop a method of posing intelligent questions about specific aspects of the future related to the success or failure of specific enterprises. By learning to formulate an inquiry concisely and meaningfully, we have a better chance of building workable scenarios than by asking global questions and trying to paint a picture with too big a brush.

A modest combination of common sense and analytical thinking can answer at least some of the more fundamental questions about future business prospects. How do the leaders of firms like Boeing and Airbus Industries estimate the potential world market for airplanes over the next ten years? To start with, they know how many airplanes of various types are currently in active service, and they can estimate the age and mileage of each. They know from experience how many years or miles of service each can provide before it is ready for retirement.

Simple arithmetic provides an estimate of the fraction of the worldwide fleet that will need to be replaced each year, from obsolescence alone. Further, they can talk to the major buyers of airplanes, such as military planners and airline purchasing people, and get an estimate of the additional seating capacity they plan to add. These two figures can provide a starting point for estimating the number of new planes that will be required in any given year.

Some of these interesting parameters can tell quite a story. I like to call them “bombshell facts.” In the US, over three-fourths of the federal government’s Medicare expenditures — providing medical care for the elderly — go for treatments provided in the last 12 months of patients’ lives. As of about the end of 1998, the median age of the automobiles on America’s roads was about eight years. The average number of telephones in the Philippines is about three per hundred people. From these disparate observations, what can we infer about business possibilities in the economic sectors involved?

## Thinking Strategically and Futuristically

Having narrowed our approach to the future significantly, and presumably disappointing some readers while reassuring others, we can set a few key ground rules for futuristic thinking as it relates to the business environments we seek to understand.

1. ***If a question is important, be willing to invest in answering it.*** Are you betting your company on the assumption that a certain market will materialize, grow, or

disappear? Do you have enough real evidence to support your conclusions? Or are you operating on intuition, hunches, and hearsay? There is a practical limit to the investment you can make in research, but it makes sense to isolate at least the key assumptions of your business strategy — or prospective strategy — and test them in some reasonably disciplined way.

2. ***Distrust your own biases.*** Wishful thinking can color your perspective on any investigation. If you're hoping your research will support a strategic decision you've already made, it's more likely you'll find the support you're looking for. If you have a strong need to believe something, you may unconsciously avoid studying it closely, for fear of getting an undesirable result.

3. ***Second-guess all information sources.*** As you read or hear any kind of business information, keep your "spin detector" turned on. Be especially aware — constantly — of the biases and personal agendas of journalists who shovel information into the business press. Sharpen your news-reading skills and train yourself to substitute your own interpretations and judgments for those of the writer. Most of us are continually assembling bits of information from all kinds of sources, and stirring it together into a stewpot of facts, projections, beliefs, assumptions, opinions, and conclusions. The best way to keep your stewpot of knowledge in good condition is to carefully censor the incoming bits of information at their source. Once they're in the stewpot, they can't be separated and evaluated on their own merits.

4. ***Look beyond the generalizations and averages.*** A stock market index conceals more information than it conveys. Look for segmentation, diversity, and variability, especially in evaluating information about people. When someone talks about "Internet users," recognize that the label they use can mask a wide range of differences and diversity. Which Internet users are we talking about: geeks, professional people, academics, children, or Internet moms? People who use the Internet for research, business, or just to kill time?

5. ***Pose questions so they can be answered.*** The structure and language of the question should imply the kind of information needed to answer it. Use focused, issue-specific questions that can deliver individual pieces of the answer to the problem you are trying to solve.

6. ***Be willing to contradict all prevailing beliefs.*** The majority is not always right, the conventional wisdom is not always wise, and the accepted doctrine could well be flawed. The more fashionable an idea, the more exempt it is likely to be from critical evaluation. Breakthrough thinking sometimes calls for contradicting the most widely held assumptions and beliefs.

7. ***Get as many perspectives as possible.*** If you're hearing the same prediction or conclusion from a number of sources, try to find a contrarian view. It could be that all the people who are touting the idea got it from the same person. Ideas with high drama potential are often picked up by journalists and passed around without real scrutiny. Someone with a radically different take on the idea can help you see it in

better perspective, even if you eventually decide to accept it as valid.

8. ***Learn to live with uncertainty and ambiguity.*** Let's face it: we can't predict the future, so let's just get comfortable using the word *guess*. We're guessing the pattern of demand in a business sector. We're guessing what our competitors will do. We're guessing what a national government will do about a particular trade issue. We need to learn to evaluate our guesses, rate them in terms of the confidence we can place in them, and consider the level of uncertainty they introduce in our models of the world we're trying to cope with.

## **Liars Figure: Beware of Bogus Data**

In one of the classic "Pink Panther" films, Inspector Clouseau, played by Peter Sellers, checked into a small hotel in the mythical kingdom of Lugash. In one corner of the small, cozy reception lobby, he spied a small dog. Thinking to make friends with the dog, he inquired of the elderly innkeeper "Does your dog bite?," to which the innkeeper nonchalantly replied "No." When Clouseau reached down to pet the dog, it snapped at him and went into a ferocious barking frenzy. Indignant, Clouseau turned on the innkeeper and cried "You said your dog didn't bite!"

The innkeeper replied, just as nonchalantly as before, "That's not my dog."

Every prospective futurist must be keenly aware of the problem of defective data. What you ask, whom you ask, and how you ask can be critical in getting valid information. For example, anyone hoping to resolve key business issues must be very careful about reaching conclusions or basing actions solely on information found in the popular press. This includes news interviews with noted people, articles and editorials in business publications, and particularly the endless "surveys" which journalists love to report on.

***There is no creature on Earth more dangerous than  
a journalist with a statistic.***

It has become common practice in the Western press to publish curious little findings taken from vaguely identified surveys by vaguely identified investigators. *USA Today* in particular likes to publish "factoids" and cute one-question survey statistics, apparently intended for people with short attention spans and little ability to think comparatively. At best, these are amusing and harmless. At worst, they can create misleading impressions and launch durable myths into the culture.

Journalists who should know better often lower their intellectual standards just to fill in a few column inches. For example, an item in *USA Today* sported the headline "Heroin use rising among US teens," and the lead sentence began "Heroin use has risen rapidly in recent years among US teens, ..." The article went on to cite a survey published in the respected journal *Pediatrics*, which it said reported that "the proportion of American 12th-graders who had used heroin *doubled* between 1990

and 1996, *from 0.9% to 1.8%.*”

What’s wrong with this statistic? Plenty. It’s very unlikely that two surveys taken six years apart could produce matched sets of answers that are comparable to the extent that a difference of less than one percent of the respondents would be statistically significant. Typically, the range of uncertainty, or margin of error, for such self-reported surveys is in the range of three to five percentage points, which would swamp any change of less than one percent. It is reasonably probable that heroin use could have actually declined, and that the 0.9% increase calculated was merely an artifact of the particular sample of students recruited.

But no matter. After all, we’re reading “McNews.” Why quibble over statistical niceties that few readers understand? And if it’s good enough for *Pediatrics*, it should be good enough for the rest of us, right? Maybe, and maybe not. Possibly the study used a very large sample and various statistical techniques aimed at isolating heroin use. The article does not report the number of students surveyed, without which we can make no judgments about the conclusions. The result was reported to one-tenth of one percent, but that doesn’t mean we can discern a difference in drug users of one person out of one thousand.

Another mysterious survey, widely quoted in 1997, concluded that nearly three-fourths of high-school girls had been subjected to sexual assault. A bit of investigation disclosed that the survey had been conducted by a group of radical feminist academics, and that it defined sexual assault to include virtually any form of interaction from bottom-pinching, bra-snapping, and pony-tail pulling all the way to whistling and winking. It made no mention of the independent finding that high-school boys reported roughly the same number of “sexual assaults” from girls. Many papers ran the story on its face value, however, and launched yet another agendite rocket into the public consciousness.

How many of these little “surveys” are pushed into the popular media and even the serious business press every day? How many people would read the report of the drug survey and file away the vague conclusion that “American kids are using heroin a lot more now. The drug problem is getting worse.”

If we’re going to make serious and consequential decisions about the future of a business enterprise, we can’t afford to be taken in by bogus data, whether it’s promoted by well-meaning but lazy journalists or by highly motivated special-interest groups with selfish political agendas.

By the way, to what extent do you rely on government statistics in making decisions about your business? Do you rely on other people who use such data? Have you ever wondered how reliable government economic information really is?

The US government’s Bureau of the Census estimates that it probably missed about 5 million people in the 1990 census count. That’s about two percent — not actually surprising, when you consider the magnitude of the job. Bear in mind that about 4.1

million new Americans were born during the census year, and about 2.1 million others died. Further, estimates of the number of people in the country illegally, and therefore not counted, vary widely. Yet many people use government population statistics as if they were somehow beyond question.

My college physics teacher, Mr. Ofelt, irritated all of us by insisting that we learn and apply a concept called “uncertainty.” We were inclined to be a bit lazy, and tended to resent his demands, but we finally got in the habit of handing in our experimental calculations based on the *range of uncertainty* in the variables involved in the problem. This meant that we couldn’t report the voltage in an electrical circuit as merely “10 volts,” but instead we had to report it as “10 volts, plus or minus .05 volts,” with the .05 volts being our estimate of how precisely — or imprecisely — we were able to read the needle on the voltmeter. If you didn’t hold your head in the same position every time, relative to the needle on the meter, you might misread the numbers under the needle by as much as one-tenth of a volt. This uncertainty, when carried through the chain of calculations involved in reporting the results of the experiment, could produce a substantial variation in the outcome.

Mr. Ofelt was insisting that we not conceal the uncertainty and blissfully report out our results as if they were pure and perfect. He wanted us to be aware of the uncertainty in all of our measurements, and to deal with the effects of that uncertainty in a very conscious way.

A more concrete business example might help to reinforce this point, which I consider extremely important. In a strategy conference with the executives of one of the divisions of Australia’s national telephone company, then known as Australia Telecom, the sales forecast for the upcoming year was being presented by a very bright and analytical chap who had done the analysis. He quickly and clearly laid out the revenue and earnings figures he’d come up with, which he expressed down to the level of the nearest thousand dollars. This seemed quite peculiar to me, in view of the fact that the total revenue figure totaled several billion dollars.

I couldn’t help but inquire about the basis for his remarkably precise figures. He replied that he’d merely taken the previous year’s sales figures, postulated a reasonable growth factor, and multiplied out the numbers to come up with the next year’s figures. When I inquired about the rationale for the growth factor, he replied that he’d simply used the growth factor for the previous year, and bumped it up by a tenth of a percentage point. What started as a seemingly precise set of revenue and earnings figures suddenly degenerated into one guy’s best guess. This is known as the *myth of false precision*, and it’s all too common in business analysis.

Inasmuch as all of the other executives in the room would have to base their resource estimates on his forecasts, this was no small matter. This led to a discussion of the means for arriving at the earnings forecast, and particularly the way in which the executive team would use it. Still hearing Mr. Ofelt’s voice in my ears, I strongly recommended that the group express the figures in terms of a *band of uncertainty*. This involved a nominal figure for the growth rate, as well as a more pessimistic

figure and a more optimistic figure. By plotting all three variables on the chart of revenue growth, profitability, and cash flow, we saw a much different, and more informative picture.

Each of the executives was then able to estimate his or her resource requirements based on a realistic range of uncertainty in the financial results. For some departments, the range of uncertainty dictated certain contingencies in their planning processes. For others, it made less of a difference.

Have you ever heard the newsreader glibly pronounce that “Retail sales rose three-tenths of a percent this Christmas season...,” and wondered how the government can estimate such a gigantic economic variable to within one-tenth of a percent? When the newsreader reports that “Government figures show the economy grew at an annualized rate of 2.1 percent last quarter...” do you wonder how an economic process valued at hundreds of billions of dollars, or even trillions dollars in the case of the US economy, can be measured down to one-tenth of a percent? If the one-tenth percent year-on-year change is valid, doesn’t the range of uncertainty have to be considerably smaller, say one-hundredth of one percent? These are statistical estimates, after all, and there must certainly be a practical limit to the precision involved.

When Ronald Reagan was trying to unseat Jimmy Carter from the presidency of the US, he harped on what he called the “misery index,” the arithmetic total of the unemployment rate, the inflation rate, and the home mortgage interest rate, all of which were uncomfortably high. However, when economists studied the inflation rate, they realized that it was heavily influenced by housing prices, which were climbing at historic rates during that period of intense real estate speculation.

The US government’s inflation index was based on a “basket” of expense items the typical citizen had to pay as part of his or her living costs. About forty percent of the expenses in the basket were attributed to housing, which was a fairly reasonable amount. However, with home prices rising at astonishing rates, the calculation reflected the assumption that every household moved to a new home every month, and had to pay ever higher prices for the principal and interest. The obvious fact was that most people who owned their homes were making the same payments every month, with no inflation at all for them.

The Carter administration found a clever and easy solution to the problem: it simply redefined the formula used to calculate inflation, and inflation suddenly dropped. Reagan won the election anyway, but some people attributed that to the Iranian hostage situation, not the state of the economy.

I suggest that, any time someone presents a statistic, an estimate, and particularly a survey result, each of us should instinctively ask two questions:

1. How credible is the source of the data being presented?

## 2. What is the range of uncertainty in this result?

These two questions would go a long way toward flushing out fraud, deceit, misrepresentation, and just plain mental laziness.

Survey results in particular deserve a skeptical reaction until or unless we know, at a minimum, the answers to several key questions:

- Who conducted the survey, and for what objective?
- Who responded to the survey, how many respondents were there, and how were they selected?
- What was the exact text of each question being reported, and for each multiple choice scale, what was the exact text of each option presented for selection, and how many people selected each of the options?
- How did the demographic makeup of the respondents correspond to the population to which the survey presenter proposes to extrapolate the results?

If the survey reporter says “Sixty-three percent of the people polled expressed approval of the prime minister’s performance,” we know almost nothing. For example, “approval” might be defined as answering with only a score of five on a five-point multiple-choice scale, or it might include those people who answered with either four or five, or it might even be extended to include people who answered with three or higher. Some surveys use a forced-choice scale, such as four options, on which the respondent cannot register a neutral or “not certain” response. This can easily skew the results in one direction or another. And, of course, the exact phrasing of the options presented to the respondents can have a huge impact on their answers.

It should be our policy to *make no important conclusions* based on reported survey results, unless the report includes the answers to the key questions just cited. Statistics presented with no visible basis for validation are nothing more than hearsay.

Another significant source of misinformation, freely tossed about in the press, are growth estimates and projections for various markets. Few sources are so subject to biases and wishful thinking, especially estimates for the growth of anything connected with the Internet. Recognize that many journalists are virtually addicted to the Internet as a news topic, because it’s so easy to dramatize the rapid growth story. And it’s especially appealing to lazy journalists, because it’s so easy to call a favorite geek-pundit for a prediction or find an entrepreneur who’s come up with a new twist on Web site marketing.

In particular, a handful of market-research firms specializing in on-line commerce, or “E-commerce,” have become the “go-to” sources of the dizzying predictions. An article in a popular newspaper quoted one such research firm as reporting that 1.2 million

people had on-line stock trading accounts as of the end of 1997, and that the number “will reach 10 million by 2001.” The prediction, however optimistic, might even turn out to be true, but does it make sense to bet your company on a one-line statistic reported in the popular press? Especially when everybody associated with the statistic — the research firm, the writer of the article, and the publisher of the newspaper — prefers to see the number as high as possible?

Russian novelist and social critic Alexander Solzhenitzyn said “It is a very dangerous thing to speak against the fashion of the times.” This is equally true of speaking against the fashion of the Internet and the gee-whiz agenda that promotes it. Reputable studies suggest that the number of new Internet users is not growing as rapidly as it did within the first two years after the World Wide Web became known, and that users are spending less time on line, on average. Yet these results seldom find their way into the popular press. The “party line” for the gee-whiz agenda is that the Internet is, and always will be, growing exponentially in all of its measures — number of people, number of Web sites, amount of information, number of purchases, amount of money spent — on and on.

The principle of the “S-curve,” discussed later, has no place in the gee-whiz agenda. So we have to live with the widespread belief that everything about the Internet will grow at a rate of 100 percent per year.

Of all predictions tossed about in the popular press and in business publications, we should question and scrutinize Internet predictions most carefully of all. There is no news topic in any of the developed economies that is so exempt from critical thinking and logical scrutiny as the Internet story. How can you evaluate an estimate of on-line sales volume and its expected growth without even knowing how the source is defining a term like “E-commerce”? Does it include only the sales registered by customers personally placing orders on-line? Or does it also include the transfer of goods between wholesalers and retailers, using the computer as a simple device for communicating the order? Does it include on-line bill-paying and banking transactions?

And, by the way, what’s the level of uncertainty (remember my physics teacher’s admonishment?) in the estimates of economic activity in such a chaotic environment? I often chuckle, and then sigh, when I read a journalist’s glib pronouncement that “On-line sales of tractor seats will rise from \$65,000 this year to \$37 million by 2005.” One of the most often-quoted Internet research firms estimated Christmas holiday sales in 1998 as “\$6 billion this year, and will leap to \$40.6 billion in 5 years, a 577% advance.” What remarkable precision! Sales of \$40.6 billion, not \$40 billion or \$45 billion, but calculated down to one-fourth of one percent. And an increase of 577%, not 500% or 600%. Clearly, either the journalist or the firm providing the estimate indulges in a bit of intellectual chicanery to impart a false sense of precision to a figure that is little more than a wild guess.

Another published estimate put the value of software piracy — programs illegally copied and distributed without paying the publishers — at \$13.1 billion worldwide. It’s

hard to imagine a more speculative estimate, and yet we have this very scientific-sounding figure, presumably accurate to less than one percent.

Another type of bogus information, which can affect the attitudes and views of business planners about the overall health of the economy is the range of stock market indexes that are so popular in the news reports. For years the famed Dow-Jones Average, and more recently the Standard & Poor 500 Index have been offered as surrogates for the growth or decline of share prices for the biggest firms in the US. When the newsreader says “The stock market nose-dived today, on news that the Prime Minister of Malaysia had a heart murmur,” he or she is usually referring to one of these two indexes. However, a close look at the changes in a large number of stocks traded on the major American exchanges usually shows that a few of them are moving strongly up or down and that a very large majority are changing very little.

For example, by early 1999, when both the Dow-Jones Average and the S&P 500 had set new records, news reports hailed an increase of over 25 percent in the S&P 500. However, almost one-tenth of that gain was caused by one stock: Microsoft, which more than doubled during the year. Two hundred of the stocks making up the S&P 500 actually declined. Indeed, over three-quarters of the total gain in the S&P 500 came from just 30 companies.

So, when the news report tells us the “stock market” posted remarkable gains, we’re being handed a dangerous generalization. The fact is that a small number of large companies saw significant increases in their share prices. This is certainly not the same as a general increase in nearly all share prices. Statisticians refer to this as the *masking effect of averages*. In some cases an average conceals more than it reveals.

If we’re going to be competent futurists, we must set for ourselves — and others — a very high standard of quality for the information we’re willing to use in making our analysis and drawing our conclusions.

## **The S-Curve: Avoiding Premature Extrapolation**

It’s a basic law of nature, or at least an ordinance, that “nothing rises to the sky.” Yet human beings insist on believing and acting as if just the opposite were true. *Trend hypnosis* is the tendency of humans to become transfixed by the momentum of events. Once a significant trend gets underway, such as a long rise in real estate prices, a run-up in stock market prices, a period of high or low inflation, high or low interest rates, or a popular fad such as the Internet, many people are quite willing to assume that it will continue indefinitely.

Stock market manias, real estate frenzies, and speculative investment bubbles of various kinds all demonstrate the remarkable power of trend hypnosis. More recently, the Internet craze has had millions of people enthralled. For a certain period popular trends seem to feed on themselves, as more and more people join in because they see others joining in. Especially where people see the opportunity to make a quick

and easy profit, and think they see others doing the same, many of them cannot resist jumping on the wagon.

In his charming book *A Short History of Financial Euphoria*, John Kenneth Galbraith describes, among others, the infamous “tulip bulb mania” that occurred in Holland in the 1630s. First imported to Holland from the Mediterranean in the 1560s, tulips grew in popularity. By some quirk of public perception, the possession of a tulip bulb, and particularly an unusual or exotic variety, conferred great social status on its owner. Demand for tulip bulbs grew, their prices rose, and at some strange point, people began to conceive of the things as having some intrinsic value beyond their utilitarian function of adorning flowerbeds and gardens. A strange euphoria seemed to set in, and by the mid-1630s people were buying and selling them at ever higher prices.

In an episode that was to become an prototype for various investment manias later in history, Dutch people of all stations in life were rushing to buy tulip bulbs before the prices rose higher.

According to Professor Galbraith:

***Speculation, it has been noted, comes when popular imagination settles on something seemingly new in the field of commerce or finance. The tulip, beautiful and varied in its colors was one of the first things so to serve. To this day it remains one of the more unusual of such instruments. Nothing more improbable ever contributed so wonderfully to the mass delusion here examined.***

***The rush to invest engulfed the whole of Holland. No person of minimal sensitivity or mind felt that he could be left behind. Prices were extravagant; by 1636 a bulb of no previously apparent worth might be exchanged for “a new carriage, two grey horses, and a complete harness.”***

***It was wonderful; never in their history had the Dutch seemed so favored. In keeping with the immutable rules governing such episodes, each upsurge in prices persuaded more speculators to participate. This justified the hopes of those already participating, paving the way for yet further action and increase, and so assuring yet more and ever-continued enrichment. Money was borrowed for purchase; the small bulbs leveraged large loans.***

***In 1637 came the end. Again the controlling rules were in command. the wise and the nervous began to detach, no one knows for what reason; others saw them go; the rush to sell became a panic; the prices dropped as if over a precipice. Those who had purchased, many by pledging property for credit ... were suddenly bereft or bankrupt. “Substantial merchants were reduced almost to beggary,***

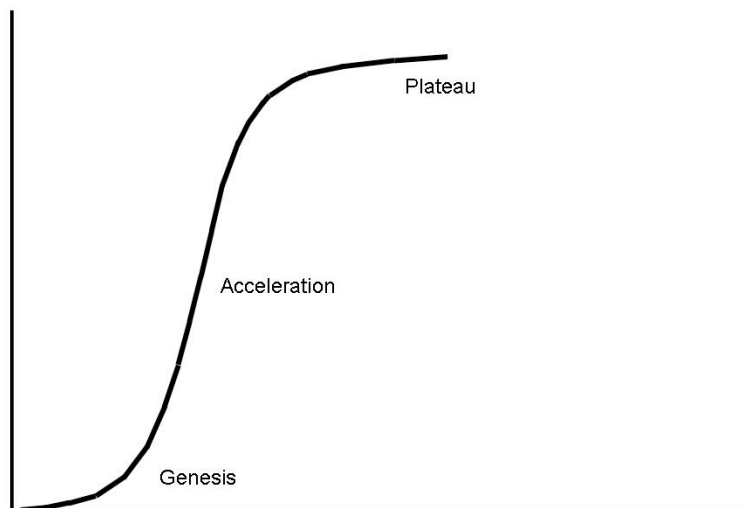
*and many a representative of a noble line saw the fortunes of his house ruined beyond redemption,” according to [Charles] Mackay.<sup>3</sup>*

It is a rare individual who can study his or her current circumstances and conclude that they are out of the ordinary and ready to change. Escaping the tyranny of trend hypnosis is much like trying to build a box bigger than the one you're in.

Every would-be futurist should have, affixed to his or her wall within easy view, a simple diagram called the “S-curve.” The S-curve portrays one of the primary dynamics of nature, on a par with the orbits of the planets and the path of the sun across the sky. It is almost mystical in its message:

***Every trend eventually taps out the source of its energy.***

Figure 5-1 portrays the S-curve in its awesome simplicity. A trend has a genesis, a beginning — shown by the “foot” of the curve, followed by a run-up — shown by the accelerating middle range of the curve, and a plateau — shown by the “shoulder” of the curve.



**Figure 5-1. The S-curve.**

When people can only see the steady upward movement of a trend, they often get fixated on the upward movement itself, even coming to believe that it will somehow continue without end. Surely, most people will agree that no trend, boom, or streak can go on forever without limit. Anyone can grasp the idea that there are finite bounds on the number of buyers, the amount of money they can ultimately pay, and their willingness to buy. Yet it's very easy for many people to suspend their critical thinking processes — “for now,” at least. The thought process seems to be: “I know it can't last forever, but I'm sure it will probably last a very long time, and that's good enough for

me.”

Economists describe the psychology of manias as based on the “greater fool theory,” i.e. the belief by a rabid trend follower that there will always be a supply of new buyers — or at least one — coming along after he or she jumps in, willing to pay more than he or she paid. Unfortunately, when the last “fool” jumps in, a current population of fools pays the profit of those who were wise enough or lucky enough to jump out after the latecomers jumped in.

According to Professor Galbraith:

***Strongly reinforcing the vested interest in euphoria is the condemnation that the reputable public and financial opinion directs at those who express doubt or dissent. It is said that they are unable, because of defective imagination or other mental inadequacy, to grasp the new and rewarding circumstances that sustain and secure the increase in values. Or their motivation is deeply suspect.***<sup>4</sup>

Trends, even manias, begin for good reasons and end for good reasons. Every major speculative boom in history has begun because something of value caught the attention of intelligent buyers. Trends only overshoot reality when others join in and buy because they’ve seen others buy, not because they recognize value when they see it. And an overextended trend dies when the intelligent buyers disassociate themselves from the asset because it no longer offers value.

When I say that I believe the S-curve is a fundamental dynamic of nature, I do not exaggerate. Take an example, offered by Theodore Modis, a management consultant formerly with Digital Equipment Corporation in Paris. According to Modis:

***Survival of the fittest dictates that the filling (or the emptying) of a niche in a competitive environment proceeds along the S-shaped pattern of natural growth. This means that the rate of growth — whether it is in world population, the spread of communism, or sales of the latest computer — is greatest in the middle of the life cycle, tapering off as growth reaches the saturation level.***

***There are limits to natural growth, and the rate of growth slows down as the population of a product or a species nears its [ecological] limit. If you put two rabbits in a meadow, you can watch their population go through an exponential-growth pattern at first, but slow down later as it approaches a ceiling — the capacity of the ecological niche. Over time, the rabbit population traces a trajectory that is S-shaped. The rate of growth traces a curve that is bell-shaped and peaks when half the niche is filled.***<sup>5</sup>

Much to the consternation of his colleagues at DEC’s European marketing operation,

Modis applied his S-curve thesis to the sales pattern of the company's successful VAX line of minicomputers on the continent and found the sales curve followed the familiar S-pattern quite closely. Even more startling, his S-curve graph predicted the next three years' sales closely as well.

Having read Modis' dissertation on the S-curve in *The Futurist* magazine, I began to reflect on the almost primal character of the mathematical form it expresses. A genesis, a rapid rise, and a plateau. Every trend eventually taps out the energy that fuels it. I began seeing it in other trend-type variables. As an amateur photographer, I was struck by the odd realization that even the light-response of black and white photographic film follows an S-curve. An underexposed image will produce only a slight darkening of the silver emulsion on the film. Adding just a bit more light will cause a much bigger change — the sudden rise of the S-curve, and adding more light than that will cause the film to darken completely. The ideal exposure is in a narrow range of light intensity in the middle range of the S-curve of its response. Above a certain exposure, the silver emulsion darkens completely and no matter how much more light falls on it, it cannot darken further because all of the silver in the film is fully converted.

I have come to believe that the S-curve is one of the most sanity-preserving tools for the would-be futurist's toolkit. It helps one to see beyond fashionable fads and manias, and to consider the source of the energy that is driving them. A legitimate trend in a real business phenomenon will tap out the energy that is driving it on a schedule that is determined by the demand that is causing it. And even a mania will tap out the manic energy that is driving it, whether it is euphoria, hysteria, greed, fear, or simply the need to be included in something.

The S-curve can be remarkably useful in building models of various growth processes. It's a good starting point for guessing about future demand for various goods and services, growth in any economic sector, and the rate at which a new technology will grow and diffuse. And it also provides a reference point for sanely observing manias, euphorias, panics, and other stampedes that can distort the reality of doing business in the New Economy.

## **Drivers, Dominos, and Wildcards**

The next step in organizing our attack on the future is to find a way to assemble and reduce the "radar data," i.e. the results of the environmental scan, into a coherent story. We need a common language, or model, for expressing the picture that emerges on each of the radar "screens." We will explore integration methods such as storyboarding and cartooning in more detail in the last chapter. For the moment, however, we can identify a few useful models for organizing the findings from each of the radars.

One simple and useful tool for extracting meaning from a particular environmental sector is the idea of a key "driver." An environmental driver is any trend, event, force, or

state of affairs that will have a primary influence on your options. These environmental drivers will be very specific to your business. A factor that is a powerful driver for your particular business might have little relevance to some other kind of business.

If you're in the business of selling cellular telephones worldwide, a key customer driver could be the rate of privatization of telecom industries in the developing countries, where demand could grow dramatically. Customer drivers include not only the attitudes and desires of your customers, but also the factors that create or reinforce those intentions.

If you're in the healthcare business in the US, and particularly in the managed care sector, one of your key economic drivers will probably be the federal government's system of rules for paying the costs of treatment for the elderly. Another might be the age demographics of the population you serve, because healthcare needs tend to become more costly with advancing age.

If you're in the stock brokerage business, one of your economic drivers will probably be the rate of inflow of funds into the stock market, which tends to be linked to the increasing or decreasing attractiveness of other competing forms of investment. The more assets your clients have in their portfolios, the more fees you will typically earn from transactions and asset management accounts. Wall Street veterans are fond of warning "Don't confuse genius with a bull market," meaning that profits may be rising more because of capital inflows than the marketing skills of the firm.

It's important to identify the drivers that will influence your business opportunities, and equally important to be able to focus on the critical few that have the primary effect. You'll need to condense the results of the environmental scan to manageable proportions in order to put them to use effectively in your strategic planning process.

In addition to identifying the primary environmental drivers for your business, it may be appropriate to consider the "drivers behind the drivers," i.e. the forces that are influencing the forces that influence your business. We can think of this in terms of a "domino chain" metaphor, i.e. a series of factors that cascade through one or more sectors of the environment, and which can produce significant effects at a distance.

*Case in point:* the public seminar and conference business is highly sensitive to the overall economic conditions in the country in which a particular organizer operates. Because a certain amount of my lecturing activity is arranged by trade associations and commercial organizers, I often see the effects of economic changes in their environments. An organizer in Chile, for example, found it necessary to postpone a conference due to the effects of economic conditions in Asia, caused by the recession that began in 1997 and continued through 1998 and beyond.

How does a recession in Asia cause problems for a seminar organizer in Chile? Because many firms in Chile export a significant portion of their goods to Asian countries, particularly China. With falling demand for their exports, their revenues and profit margins begin to shrink, and they turn to cost-cutting procedures to defend their

shareholders' assets. One of the first casualties of any economic downturn is usually the budget for training programs and conferences. And so the conference organizer finds himself at the end of a domino chain.

*Case in point:* when Philippine Airlines ran into financial difficulties in mid-1998, and temporarily went out of business, it canceled orders to Boeing Aircraft Corporation for new jumbo jets. Boeing scaled back its production schedule as a result of that and other cancellations and postponed orders. Hundreds of smaller firms supplying various parts, materials, and assemblies to Boeing experienced a drop in orders from the company and saw increasing pressure on their profit margins. A domino chain beginning in Manila had an effect as far away as Seattle, southern California, and dozens of other parts of the US.

This domino chain effect comes into play in many industries, particularly those in which businesses buy and sell from one another. As part of your environmental scan, it's important to trace out the possible domino chains that could be affecting your opportunities. Your dominos may not all be strictly economic. For example, a change in a law, or a change in international trade policies or tariffs could affect the behavior of your customers or their customers. Government policies can cause domino effects throughout various business sectors, which can cascade through a series of impacts.

It's important to review the known drivers and dominos, but what about the unforeseen event, the "wildcard" factor that comes as a surprise? What about the potentially significant change that might or might not happen? Your opportunities might be significantly different if a certain law takes effect than if it doesn't. A significant merger of the two biggest firms in your industry could change all the rules of the game if you're not one of them. Normalizing relations between two political factions, such as Israel and the Palestinian groups, or between countries such as the United States and Cuba, could create significant business opportunities.

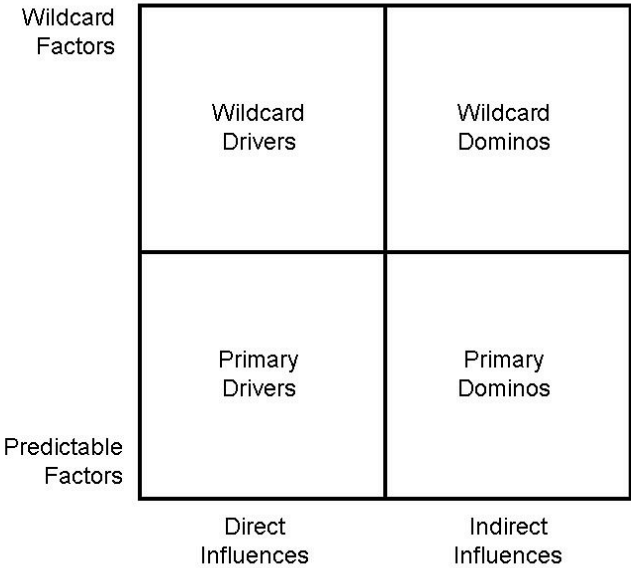
Some wildcards seem to come from nowhere, catching everyone by surprise. For example, many foreign banks and investors were stunned in mid-1998, when the Russian government did the unthinkable: it reneged on billions of dollars of foreign debt. It suspended payments on foreign loans and froze assets in securities markets that might have been withdrawn from the country. Malaysia's prime minister Mohammed Mahathir, took a similarly provocative step when he froze foreign capital flows out of the country to put the brakes on currency speculation against the ringgit.

Although it's obviously not possible to think of all the surprises that might happen, even in your particular industry, it may still be worthwhile to speculate on some of the imaginable possibilities. For example, what about the death or downfall of the head of state of a country where you're planning to do business? How would the death or incapacitation of a high-profile corporate leader like Microsoft's Bill Gates, Disney's Michael Eisner, or GE's Jack Welch affect the individual business and the futures of various enterprises linked to it? How might a major ecological disaster affect the fortunes of a particular industry or company? How might a major medical breakthrough affect the market for an existing pharmaceutical product?

Think of an environmental wildcard as a recognizable possibility that is sufficiently significant in its potential impact that it deserves to be studied and planned for.

We can put together the results of the environmental scan in terms of the drivers, dominos, and wildcards we've been discussing, in a simple diagram such as Figure 5-2.

By categorizing the drivers in terms of the degree of their influence, i.e. the primary drivers and the dominos, on the horizontal dimension, and arranging them by likelihood, i.e. known drivers and wildcards, on the vertical dimension, we can build comparable pictures for each of the eight key radar screens.



**Figure 5-2. Drivers, Dominos, and Wildcards.**

The lower-left quadrant of the diagram tells the basic story. For a particular radar dimension, such as the technological radar, it lists those few primary events, trends, forces, or conditions you have identified, which you believe will have the strongest influence on the growth possibilities of your business. The lower-right quadrant lists any secondary drivers, or dominos, i.e. cause-and-effect sequences that you consider important to your success. On the upper level, the upper-left quadrant lists the primary speculative events, i.e. wildcards, that you consider sufficiently influential that you choose to track them on your radar. And the upper-right quadrant lists the wildcard dominos that could materialize under certain circumstances.

Now that we've warmed up our minds and armed ourselves with the proper tools and cautions, we can proceed to study each of the eight strategic radar screens, to see what we can learn that may be useful in growing a business enterprise.

## Chapter Notes (5)

1. The World Future Society has a publishing program, sells books and reports related to futures issues, and holds an annual conference. Its monthly magazine, *The Futurist*, carries articles on a wide range of specific topics of interest to futurists. You can contact them through their Web site at [wfs.org](http://wfs.org).
2. The Worldwatch Institute conducts studies, sponsors conferences, and publishes articles and a monthly bulletin dealing with specific issues related to sustainable development. You can contact them through their Web site at [worldwatch.org](http://worldwatch.org).
3. Galbraith, John Kenneth. *A Short History of Financial Euphoria*. New York: Penguin Books, 1993, page 28. The lines attributed to Charles Mackay by Galbraith are from his celebrated book *Extraordinary Popular Delusions and the Madness of Crowds*, published in London in 1841.
4. Galbraith, John Kenneth. *A Short History of Financial Euphoria*. New York: Penguin Books, 1993, page 6. The lines attributed to Charles Mackay by Galbraith are from his celebrated book *Extraordinary Popular Delusions and the Madness of Crowds*, published in London in 1841.
5. Modis, Theodore. "Life Cycles: Forecasting the Rise and Fall of Almost Anything." *The Futurist*, Sept-Oct 1994, p.20.
6. An indispensable reference for information about the United States is the US Department of Commerce's *Statistical Abstract of the United States*, published annually. Readers unfamiliar with it may be astonished at the range and depth of information about almost every conceivable aspect of America and its people. It also contains a useful list of key US government agencies, with their contact details and Web site addresses, as well as a list of statistical abstracts published by other major nations, and where to get them. You can start at the Department's top-level Web site, [doc.gov](http://doc.gov) and go from there to a wide range of other useful sources of information.
7. A useful reference for firms wanting to do business in various major countries is *Dun & Bradstreet's Guide to Doing Business Around the World*. Morrison, Terry, and Wayne Conaway and Joseph Douress. Englewood Cliffs, NJ: Prentice Hall, 1997. You can contact the authors through their Web site at [getcustoms.com](http://getcustoms.com).

