

A DEFT Approach to Trend-based Foresight

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Abstract: Trend projection is a critical element of most forecasting models. Automatic forecasting methods typically glean trends from past data and extrapolate these trends forward, but do so without consideration of the forces that nurture the trend – and that eventually may turn on it. A DEFT framework identifies mechanisms to probe behind the trend to identify its underlying: Drivers, the forces that create and sustain a trend; Enablers, catalysts such as financial support for the Drivers; Friction, resistance or inertia that impedes a trend; Turners, events and policies that actively block a trend. Understanding a trend as a reflection of underlying driving and blocking forces reveals why trends are capable of their sudden surprises and reversals. Although actively looking behind the numbers makes for less immediately quantifiable foresight, it is a necessary price to pay to avoid gross forecast error. DEFT does for trend projections what SWOT analysis provides for strategic planning. It offers a framework for organizing and analyzing factors that will promote and retard the success of our endeavors.

INTRODUCTION

Trend projection is the bread and butter of forecasting, and the most common basis of prediction among professional and lay forecasters. Its intuitive logic powerfully rests on empirical justification: we can see something growing or dissolving before our eyes – in the data, at least – and we can measure the rate at which it is happening. The obvious next step is to ask, “Where is this heading?”

Extrapolation of past data is reassuringly amenable to quantitative calculations. If there were 165,000 people living in Las Vegas in 1980, 260,000 in 1990, and 480,000 in 2000, we intuit a trend direction and rate, and feel halfway to a valid forecast. It is then a simple step to achieve a prediction by extrapolating that growth rate to 2020 or 2040. To cover ourselves (“Hey, nobody can predict the future”), we can do mathematically more complex things than mere linear projection, perhaps applying moving averages or weighting part of the time series; and because we assume we’re unlikely to get the rate exactly right, we cover ourselves with “base,” “high,” and “low” projections so that “somewhere in there” the future is captured. It feels like solid analysis.

Moreover, trend projection is also “agnostic.” It does not ask *why* a trend is moving, which would allow subjectivity and opinion into the analysis. It only notices that the data are moving in a certain direction and follows this movement into the future. In other words, it allows us to bypass the *causes* of events and behavior that may be tricky to identify or agree on. We don’t have to debate open-ended questions such as *why* people

are choosing to settle in Vegas, what they are doing there, or what that depends on, etc. We can just record and verify that the trend exists and follow it forward.

If forecasting were as simple as extrapolating in this way, it would be an easy game indeed. The problem with trend projection is it assumes the future will be a logical extension of the past. This, as Paul Saffo (2008) put it, is “looking into the future by taking a ruler from the past and turning it around.”

To turn the ruler around is to make a huge assumption: that the same conditions that underpinned the trend until now will continue to apply. But if the sad and sorry arena of failed predictions tells us anything, it is that, given one incorrect assumption, a forecast will be out by miles, not inches. In 1910, a Bell telephone statistician predicted a massive ramp-up in switchboard jobs as telephone use grew, until “every woman in America” would be employed as a switchboard operator. This correctly projected rapidly growing telephone service demand, but missed automated switching. A mistake in data recognition, collection, analysis, or projection will typically result in a small error of forecast. A mistake in assumption will result in a forecast of such huge error as to be comic – or tragic.

Mistakes of flawed assumption suggest that extrapolators see the trend they’re projecting as a kind of “force” of change that is taking us forward to the future. But a trend is no more than a pattern of change in recorded data, evidenced by a rise or fall of a measurable variable when compared at two or more points over time. A trend is, in other words, the record of underlying forces at work, the evidence of those forces – but it is not those forces. And it is these underlying conditions – the “force field” sustaining the trend – that determine how the future will play out: whether the trend will go forward, stall, reverse, or change direction.

The DEFT framework – Drivers, Enablers, Friction, Turners – is offered here as a basis for determining the range and type of force underpinning a trend.

Drivers: The forces that cause a trend to move (that is, cause the emergence of a pattern in the data) and sustain it. The trend to hybrid automobiles is driven by higher gas prices, environmental concerns, and automotive technology advancements. The trend to “just-in-time” production is driven by globalization and improvements in supply-chain-management software and communications, and so on.

A driver may itself be a trend. That is, the globalization trend driving “just-in-time” production is itself the product of many driving forces: WTO duty relaxation, global media, spread of English as a world language, and so on. In another example, miniaturization is a driver of many innovations in electronics, but is itself a trend with antecedent technological drivers. In this way, we often have “driver-trend layering,” where a driving force creates a trend that is the driving force of another trend. We can therefore understand drivers as being “nested,” and some drivers to appear as trends, which are further reducible to their more essential drivers.

Further, a driver can underpin more than one trend. The “aging” trend is driven by advances in medicine, better access to health care on average, healthier lifestyles,

improved education levels, etc. But improved education also drives trends such as lower infant mortality, a rising global middle class, the empowerment of women, and so on.

Enablers: Any factor that promotes, facilitates, or catalyzes a driver. For example, government biomedical laboratory funding would be an enabler of biotechnology breakthroughs (which would drive trends in drug development and medical practice). Venture-capital backing and other forms of investment are enablers of small business entrepreneurship, which drives economic growth and employment. Changes in regulation to facilitate and desired outcome (foreign investment for example) is another common type of enabler.

Enablers are not always easily distinguishable from drivers. For example, intellectual property protection (patents) enables and facilitates a more rapid spread of ideas that would otherwise remain proprietary, which spurs further research. One might be tempted to say that “intellectual property is the driver of research.” But to do this is to overlook an important distinction and assert a causal relationship where there is merely a facilitating one. The distinction between a causal relationship and a facilitating or catalyzing relationship becomes important in working out what sustains a trend and how so, and therefore what might happen if and when a sustaining element disappears or the mix of sustaining elements changes. A driver may work without a catalyzer, but a catalyst has no effect without a driver.

Friction: The resistance to change that occurs naturally and inevitably in human and other systems. Socially and culturally, most people are invested in traditional ways and patterns that are not easily overcome. We judge innovation against the way we currently do things, and any new approach must overcome educational and financial obstacles to its adoption. It is often more convenient, less risky, and less costly – initially – to do things the old way. This causes inertia, a “stickiness” of the status quo that provides ongoing, low-grade resistance against change drivers and their enablers, slowing down a trend.

Other common sources of friction are legacy systems in industry, legacy products owned by consumers, embedded administrative procedures and habits, and existing legislation. These will stand in the way of change, not out of ideological, political, or similar motivational stance, but because it just takes time for people to alter the way they do things and the systems they are imbedded in.

Turners (and Blockers): These are forces where there is intention and agency at work to oppose a trend, actively seeking to delay it, stop it, or turn it back in another direction. Trend-turning forces – think of them as “counter-drivers” – are enacted when people or organizations disapprove of a trend or it runs counter to their interest.

Trend blocking and turning, therefore, goes hand in hand with agency and power. The tobacco industry was able to counter the trend against smoking for more than 30 years. The medical and social evidence against tobacco was strong, but any forecast that ignored industry power to block and shape trend outcomes would have grossly underestimated how long it took before smoking would become socially and legally unacceptable. Business has many ways of turning trends in industry – by lobbying, for example, or by buying out competitors. Trend blocking and turning is also a staple of politics and the

judiciary, accomplished through legislation; and of public-interest organizations (media campaigns, protest-petitions, street marches, etc.). Forecasts that run a trend forward without anticipating such countering forces are inevitably wrong on timing and often wrong on substance too. Real, lasting change in the direction of a projected trend will only occur if and when drivers overpower countering forces.

Culture and values are another key source of trend turning. In the trend toward cloning humans, for example, the key question in determining the future is not whether it can be done, but whether most people *want* to see it done. If the answer is no, counter-trend forces will be certain to emerge to head off the trend. While these forces are strong, the trend is going nowhere, no matter what techno- bio- or nano-experts can see in the lab. Obviously different social groups or different societies may hold different values, and in a different context the trend could move rapidly.

THE BENEFITS OF A DEFT ANALYSIS

We can thus conceive of the future as what will happen as forces for change battle forces that inhibit or redirect change – drivers and enablers versus friction and turners/blockers. Any moment in the future will be the net effect of these forces at that point in time. Good foresight work will investigate each of the DEFT categories, and provide a sense of the balance of power for and against the trend. In a static situation, by definition, the total force of drivers and enablers is equal to the countering force of friction and blockers-turners. Where we have a steady transition – a trend – change drivers and enablers are slowly overcoming countering forces. Where drivers and enablers are strong and blockers are weak, we can expect the pace of change to be rapid and, under extreme conditions, exponential. Where blockers and turners are strong, we should expect them to deflect or nullify the trend, or reverse it altogether.

It is worth noting that to scrutinize the DEFT categories is consciously to restore the “why, how, who, and what” questions to trend analysis that modeling typically overlooks. Why is this trend moving? What will keep it moving, or how will it be dissipated and who may stop it? Actively looking behind the numbers makes for less immediately quantifiable foresight, but this is a necessary price to pay in avoiding gross forecast error.

Understanding a trend as a reflection of underlying driving and blocking forces also clears up another apparent puzzle: why trends are capable of such surprising shifts and reversals. This is not a puzzle if we see that a trend has no life of its own. It is a candy wrapper in the wind: when the wind reverses, the wrapper reverses; when the wind stops, the wrapper stops. It is only as dependable as its underlying and countercurrent forces. The DEFT view of trends makes us watch the wind not the wrapper, and so helps foresight analysts in the following three vexing situations:

Anticipating Systemic Interaction and Complexity

A key problem in simple trend projection is the implication that we can validly separate out the variable we are interested in and roll it forward, without allowing for the complexity of how other variables affect it and each other, and therefore the whole emerging picture.

A famous example of extrapolating a single trend while failing to account for broader systemic forces was various 1970s forecasts asserting that the world was running out of oil. The rising oil-consumption trend of the day was put against known reserves, leaving a simple calculation as to what year oil would run dry. These forecasts did not take into account advances in computing, geophysics, materials science, and engineering that favored improved discovery and recovery of oil, as well as more efficient refining processes, all of which changed the trend line.

The DEFT perspective helps us unmask interactive driving and enabling effects such as these, allowing us to see unexpected consequences. It also primes the analyst more broadly for a “systems view” of change, one that factors in how variables are linked in ways that are self-reinforcing or self-limiting. If a driver systemically reinforces itself – for example, wage pressure leading to inflation, leading to yet more wage pressure – that driver becomes progressively stronger, creating greater and faster change than a simple trend projection would allow. Self-limiting systems, on the other hand, exist when variables are linked in a way that is intrinsically corrective of change. Systemic action against change will stall the trend, or lead to side effects or “blowback” situations, all of which will be invisible to the trend extrapolator.

Seeing Trend Breaks and Inflection Points

Nassim Taleb (2008) memorably encapsulates the demerits of extrapolating trends in “The Turkey Problem.” Imagine you’re a turkey. Every day a nice man comes to feed you. Every day you get bigger. Your feedings get bigger, too. If you extrapolate these trends, you will confidently predict a your own continued growth, happily enjoying ever-larger meals.

But your future is Thanksgiving.

This is hard reality for those who predict the future by extrapolating trends. Even if our turkey has excellent data points, carefully observed and diligently recorded, and even if our turkey is mathematically sophisticated, applying all the latest modeling techniques from moving averages to compound regression — he is still going to be wrong about his future. Dead wrong. All the data analysis in the world, all that fancy computer software, all that pricey consulting time bought and paid for, and he’s not just slightly under or over in his projection. He’s plucked, stuffed, and roasted.

The lesson is, there is often something outside a trend – a framing condition that is set to cause a break, inflection point, or “discontinuity.” (But, vexingly, there may not be.) A future-determining framing condition is not easy to see, but it will be always be invisible to trend-based extrapolation. A DEFT-based analysis at least points at the framing and

determining conditions behind a trend, and thus has a fighting chance of seeing external “game-changers.”

Getting a Better Grip on the Pace of Change and Its ‘Lumpiness’

Trend tracking gives the illusion of a dependable rate of change, sometimes acknowledging past accelerations or decelerations, but still aggregating them into an overall steady growth or waning to the present. This greatly increases the risk of mistakenly implying a constant pace of change in the future. But, even where trends do evolve as expected – where interactive effects or trend breaks do not occur – they seldom evolve at the expected rate. They speed up and slow down, which is, of course, a function of the changing balance between DEFT elements.

More misery for trend projectors lies in the fact that the forces behind a trend seldom have a linear effect on it. If the DEFT field remains unstudied, and the analyst has at best a vague sense that “X leads to Y,” she or he would likely assume that more X leads to greater Y (i.e., Y coming into being faster). But linearity of cause and effect appears only in textbooks, not the real world of lags and thresholds. Often the application of a force results in “no change” as the system absorbs and compensates for its impact, but only up to a threshold or “tipping point,” whereupon the trend kicks in and sometimes runs exponentially, causing fundamental change or system collapse. Lag and threshold effects are notoriously hard to anticipate or model, but lack of insight into a trend’s sustaining conditions makes it impossible.

Sometimes change is held back due to one specific blocker or, as scientists term it, the “rate-limiting factor.” It may take an outside event to overcome this factor, and so shake loose an even balance of forces for and against a trend. New funding sources, an assassination, a scientific breakthrough – are the kinds of jolts that can release a trend or reverse a running trend. The implications a surprise event will have on a trend are invisible unless we consider the trend in its DEFT components.

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