ForeTell – A View Through Dr. Rich Adler's Looking Glass

Several years ago, my friend, Marv Goldschmitt, introduced me to his colleague, Dr. Richard Adler. Rich had developed a breakthrough tool for decision modeling that he calls **ForeTell.** Rich and I check in with one another periodically to see how things are developing in each of our fields of endeavor. I thought that I should share with readers of this Blog some of my recent conversation with Dr. Adler about **ForeTell** and his company, DecisionPath.

Al: "Rich, I have watched with fascination the different and widening applications you are finding for your Decision Modeling Engine - Foretell. How do you explain to a layperson what Foretell does?" (www.decpath.com.)

ForeTell is a tool for exploring and comparing alternative strategies, plans, or policies in complex environments over extended time frames. ForeTell helps you to capture and leverage your available knowledge about critical situations in order to answer the question: "If we make decision X and the world evolves along path Y, what will happen to us (and to other interested parties such as customers and competitors)? In essence, ForeTell provides a low risk, virtual "test drive" for critical decisions.

To elaborate, it may be helpful to contrast ForeTell briefly with two alternate approaches.

First, the trade journals advertise business intelligence (BI) solutions such as databases and executive dashboard user interfaces as "decision support tools". In fact, BI tools only provide what we call situational awareness: they aggregate and summarize past and current data to help users understand operational status and historical performance and trends. These results are clearly necessary inputs to considered decision-making, but they do not support – that is, actively enable or improve -decision-making processes. In contrast, ForeTell provides an explicit methodology and powerful modeling, simulation, and analysis software that target the crux of real world decisions: helping you to anticipate how key stakeholders will respond and adapt to your proposed actions, changes in their environment and the actions of others.

Second, many vendors of simulation tools would assert that their modeling software provides true decision support no less than ForeTell, including spreadsheet engines and Monte Carlo, Bayesian network, and system dynamics simulators. Our response is that these solutions are analogous to cameras that take pictures of the world with a film that is only sensitive to one color, such as blue or orange. Real world situations involve complex combinations of dynamic forces. By focusing on a single type of information and situational dynamic (e.g., numbers and financial or engineering formulas), these tools expose decision-makers to serious risks of omission and distortion. In contrast, ForeTell unifies several complementary dynamic modeling techniques within a single framework, providing higher-fidelity "what-if" projections (like "Kodachrome®").

Al: "I was intrigued that in our last conversation you mentioned Avian Flu and epidemiology as a potential application of Foretell's capabilities. How would your tool be able to help the CDC predict the spread of a flu epidemic and take appropriate preventive measures?"

Every ForeTell application embeds expert knowledge about a particular type of decision and/or government or business segment. We are currently developing a ForeTell prototype that captures epidemiological information about infectious diseases, population demographics, and the dynamics of disease propagation (e.g., viral agents carried by parasites on birds, cross-species transmission, etc). We are looking to partner with infectious disease experts to incorporate public health knowledge concerning quarantine protocols, vaccinations and therapeutic drugs, health care system capacities, population behaviors during crises, etc).

A variety of numeric models already exist for simulating disease outbreaks. What we believe is unique is ForeTell's capability to combine that knowledge with more qualitative simulations of goal-driven (or "intentional) behaviors of populations at risk, government officials, and health care providers and networks as they adapt to changing conditions.

The resulting ForeTell system will enable public health users such as the CDC to:
· Rapidly define situations and conditions, either national or global, that precede or occur in the midst of disease outbreaks
· Impose different assumptions about trends and events likely to influence the "trajectory" of an outbreak
· Define alternate intervention strategies (combining quarantine, immunization, and treatment plans)· Project the likely outcomes of those strategies across diverse outbreak scenarios
· Analyze individual projections and compare key metrics (infected populations, survival rates…) to identify the most robust intervention strategies to adopt.

Al: "Early in the life of Foretell you worked on a simulation of a terrorist attack. What can you tell us about that simulation?"

We were approached by the Director for Homeland Security at the Center for Strategic and International Studies (CSIS), a Washington D.C., "think tank", to help them improve human simulations of national security crises such as terrorist attacks. CSIS assembled retired Government officials to play leadership roles (e.g. the President, National Security Council members) and apply current policies against plausible threat scenarios to uncover how those policies might perform. Computer models exist to predict outcomes of physical events, such as the path of the radioactive plume from a reactor explosion given specific wind patterns. However, what the "leaders" really wanted was a "physics" model that would project the social, political, and economic consequences of proposed courses of actions, locally, nationally, and globally, short-term and long-term, and taking into account anticipated responses of adversaries to those strategies. We were told that the Government has accumulated knowledge about terrorist groups and their behavior patterns over several decades, but that existing software tools could not model and exploit that knowledge in their "what-if" projections.

Given a "lessons learned" report from one of these exercises, we were able to develop a Pilot simulation that demonstrated how ForeTell could be used to explore cost-benefit trade-offs of different strategies (e.g., adopting different security measures) to increase preparedness in the face of an emerging terrorist threat. We also hooked up this simulation to a Geographical Information System (GIS), so that as intelligence evolved over time and government agencies or terrorists acted, these changes were displayed on a map.

Al: "It seems to me that there are broad varieties of scenarios in which Foretell could be useful - both in dealing with man-made events like a terrorist attack, and naturally occurring phenomena - like an epidemic or a natural disaster. What kinds of companies and government agencies could most benefit from Foretell?"

The specific ForeTell application that we are developing would benefit the CDC, the Department of Homeland Security, which includes the Federal Emergency Management Association (FEMA), and the Department of Defense. This system would address not only natural disease epidemics, but also outbreaks resulting from bio-chemical and or radiological weapons engineering by terrorists or hostile countries. Other interested parties would include counterpart emergency management and public health organizations at state and municipal levels, the United Nations, other non-government organizations (NGO) with similar charters. Multi-national corporations could be interested in this system as part of their emergency

preparedness planning efforts.

This type of ForeTell model can be adapted or extended to address various other strategic planning applications involving national security, business continuity planning and investment strategy. A key aspect of infectious disease decision models is that effectively strategies rarely result from selecting one approach from a set of mutually exclusive alternatives – A vs. B vs. C. Instead, robust strategies will consist of a collection of measures (e.g. quarantines, interdicting travel, particular therapeutic regimes, etc), schedules (e.g., ordering and staging activities in time), and allocations of resources (e.g. Five million dollars to measure A, etc).

More generally, security and preparedness problems are amenable to portfolio management decision techniques, which involve allocating effort and resources across a set of investments or activities in order to maximize one's return, such as increasing the level of protection against one or more threats. ForeTell's "sweet spot" consists of this kind of portfolio management problem, which involves involving uncertain and incomplete information, extended time frames, diverse actors with independent agendas, and complex environmental forces.

Al: "For those of us who are not technologically sophisticated, can you give an example or a case study of how ForeTell makes a difference in the real world?"

Actually, if you don't mind, I'll share two case studies that I think will illuminate what I am talking about in terms of Foretell's practical capabilities.

Example 1:

We recently developed a ForeTell application with the chief learning office at a systems integrator that targets the difficult problem of managing organizational change. This system allows you to describe a pending transformation such as a corporate reorganization, an acquisition, or adoption of a new technology platform. You can also sketch dominant environmental forces, both external (e.g. economic conditions, competition) and internal (e.g., resource, leadership changes) and possible events that likely to influence the landscape (e.g., a merger of key competitors). Most importantly, you can define change enablement initiatives to address the uncertainties, fear, and resistance that disrupt operations and momentum when companies embark on change. The application includes a library of pre-defined components to help you assemble decision models quickly and consistently. ForeTell then projects the likely impact of your proposed change strategy on your organization's readiness to change, and helps you identify gaps and refine your intervention plan to improve its likely effectiveness.

Example 2:

We recently developed a ForeTell application with a leading pharmaceutical consultancy. Its purpose is to help drug companies optimize their investments in marketing and sales channels for FDA-approved drugs (e.g., physician detailing, direct to consumer advertising). Given a list of drug companies, their drugs for a medical condition such as heartburn, and estimates of their monthly spend rates in different channels, the application projects the market size and allocation of market share across competitors. This simulation helps a drug company optimize its investment in its drug's "marketing mix". The problem is that such models presuppose a static marketplace. In fact, if you adopt a strategy and it is successful, your success will soon "show up on the radar screen" of your competitors (courtesy market intelligence vendors such as IMS Health, Inc). and they will adapt their strategies to counter yours. Incidentally, this exact problem afflicts the Department of Homeland Security: the media announces every new counter-terrorism prevention measure that DHS institutes, such as new airport scanners or

border security measures. Terrorists (who are much more adaptive and opportunistic than drug companies) eliminate targets that are no longer "low-hanging" fruit and focus their attack planning at the next level of weakly protected targets, changing the game.Our ForeTell drug application addresses this problem by modeling available knowledge of how competitors (or adversaries) are likely to respond to perceived changes in their environment. For example, if Competitor-X sees a decrease of market share of between 0 to 10% over 3 months, they are likely to respond by increasing advertising and detailing by 15% over the next quarter. The resulting simulation resembles a chess game that more accurately reflects the evolution of real-world scenarios and strategies: if we do X and competitor-X responds by doing Y, what will happen to all of us and to the market? Marketers at major drug companies (and counter-intelligence authorities) routinely collect this kind of intelligence. Prior to ForeTell, however, it was difficult or impossible to incorporate such behavioral knowledge and leverage it in a predictive model for guiding strategic planning.

Al: "Rich, thanks for taking the time to explain what ForeTell is all about."

For more information on ForeTell, DecisionPath and Dr. Adler's work, I encourage you to visit his Website: www.decpath.com.

Al

Reprinted