∞ ∫ Δ

Understanding the Future

The Collaborative Modeling Process

July, 2011

The Collaborative Modeling Process

Stephen J. Daniel is founder and president of **Daniel Research Group,** a technology market research firm specializing in the design, development and application of market models and forecast. The following article contains material drawn from his book, *Understanding the Future, A Practical Guide to Designing and Developing Context Specific Segmented Forecasts and Models For Technology Markets*

Humans alone among the creatures on this planet have the capacity to project hypothetical and multiple temporal cause and effect relationships, and their consequences. This is perhaps our most powerful survival trait. As we observe the world around us, we attempt to make sense of this jumble of sensory inputs by seeking the patterns that we "know" must be there. Finding those patterns, we deduce cause and effect over time. We then imagine something that we have no empirical evidence for, the future, and extrapolate the continuation of what we have observed and deduced forward in time. This extraordinary capability allows us to change the future, to prepare for and avoid danger, to exploit opportunity, and to efficiently use scarce resources. In other words, to understand and therefore to survive.

However, this capability in not optimized for the world that we live in today. For the past 200,000 years, our memes have evolved exponentially faster then our genes. The senses that we use to bring observations into our mind, the inventory of patterns that we apply, and the process by which we create imagined futures are based on a vocabulary of symbols that allow us to think in abstractions that are often beyond our own conscious awareness, and frequently defy our ability to represent in formal notation.

This vocabulary is as much a relic of our past as is our appendix. Portions of it are remnants of our pre-human mammalian and even reptilian past. The human portion is rooted in our earliest hunter-gatherer societies. We naturally think in terms of comparative magnitudes (larger, smaller, more then, less than), motions (stationary, moving, faster, slower), social relationships (us, them), and responses (fight, freeze, flight). While we all have a good feel for what the average condition is, few of us have an intuitive sense of a standard deviation. As an example, for most of us, the representation of an observed causal process over time and its extrapolation into the future is best understood visually via the graph below, than with notation via the equation $Y = \alpha e^{\beta X}$.

$$y = \alpha e^{\beta x}$$
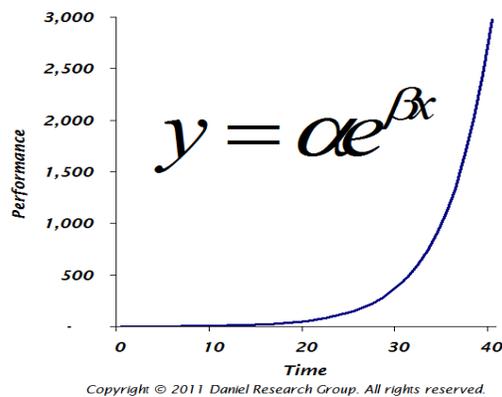
We absorb the meaning of the graph more efficiently than the meaning of the equation. The graph tells a story with a beginning, a middle, and an end. While the equation tells the same story, it does so in a less intuitive way. Human pattern recognition is not a computational process; it is a recall and comparison process that is inherently bounded by the inventory of pre-existing patterns. Because of this inventory limitation, information can be misinterpreted, or lost, leading to incorrect assumptions about cause and effect, and ultimately a sub-optimal response

Real and imagined experiences are the two mechanisms that expand our pattern inventory. Philip E. Ross in his Scientific American article The Expert Mind, states that experts are made, not born. It is through practice, rehearsal, and learning from experience that experts acquire the rich and varied inventory of patterns enabling them to think at ever-higher levels of abstraction, and grasp intuitively the true nature of reality. The most gifted among us also have the ability to create new patterns directly from the store of observed patterns, essentially adding alternative patterns that may or may not ever represent a future state. However, if reality ever does conform to this imagined state, the expert will recognize and understand it.

Designing and developing market forecast models requires two sets of complementary core competencies, those of the **Model Builder** encompassing the mathematical, computational, and forecast methodologies, and those of the **Knowledge Analysts** encompassing qualitative assessment of the factors and trends influencing the products and markets being modeled.

The very best Knowledge Analysts are extraordinary people, experts in their area, and as such, think at levels of abstraction that are not easily quantifiable. They often develop their understandings intuitively rather then computationally. The single most important task of the Model Builder is to build a bridge between the Knowledge Analysts qualitative assessments of the market and the quantitative requirements of the model.

The Collaborative Forecast Modeling Process
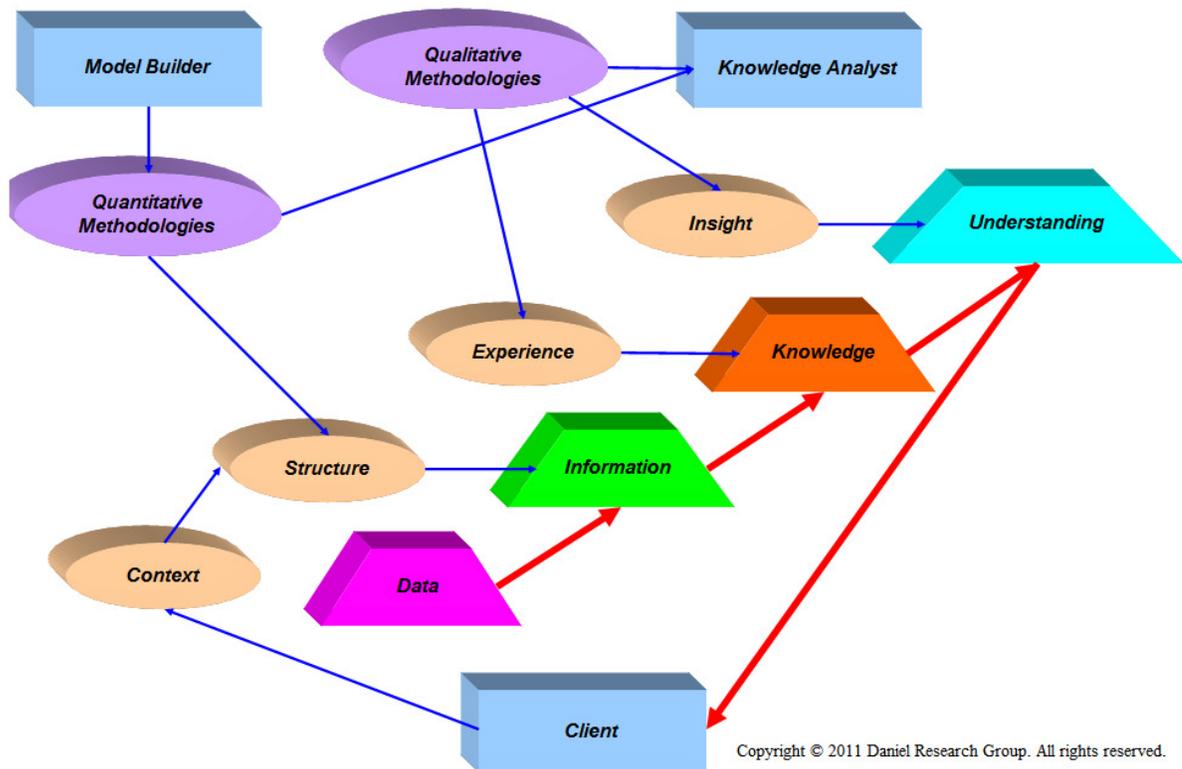
The process by which the model builder and knowledge analyst reach the goal of understanding flows through three transformative steps.   Data is transformed into information by the application of a structure provided by the model builder and reflective of context. Information is transformed into knowledge though the filter of the knowledge analyst's experience. Finally, understanding is achieved by the addition of knowledge analyst's insights, the leap to a higher level of abstraction that has meaning for the client.   The product of this process is the model. However, the model is never the answer; it is just a useful way of asking the question.
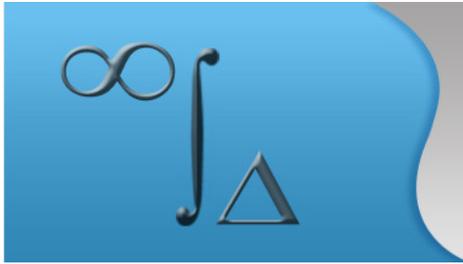
Daniel Research Group
## Understanding the Future

Daniel Research Group offers consulting and market research services to clients whose products and services are technology based or enabled. The primary focus is on providing results, solutions, consulting and training to clients that have strategic and tactical decisions that require Forecast, Segmentation, Market Share, and other market modeling requirements These engagements are supported with the full range of traditional market research data gathering and analysis services, including quantitative and qualitative surveys, focus groups, demographic and firmographic data acquisition and analysis, as well as input from technology and industry experts. While our emphasis is on delivering data and actionable recommendations, we often design and develop custom models and modeling tools for client use as well as providing training in these areas.

Stephen J. Daniel - President

Mr. Daniel's three decades in the Information Technology Industry has given him a unique blend of Market and Technology experience coupled with a deep understanding of Market Research Methodology. His primary strength is in understanding the decision making context within which the results of his research will be applied. This is manifested by his ability to design and execute studies that precisely meet client objectives on schedule at reasonable costs.

After receiving his BS in Finance in 1970 from Northeastern University, Mr. Daniel earned an MBA in Quantitative Analysis from New York University in 1974. He is a member of the American Statistical Association, The Market Research Association of America, the American Marketing Association and the Qualitative Research Association of America.
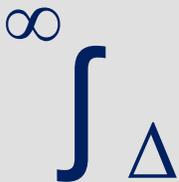
DanielResearchGroup.com
49 Hill Road, Suite Four
Belmont, Massachusetts 02478
(617) 484-6225