

# Simulation-Based Performance Analytics

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By C. Dennis Pegden, Ph.D.

Imagine a rapid modeling tool that not only lets you quickly test countless variations on a plan but also produces data on each alternative, allowing you to get a glimpse into the future of your project.

Imagine software that answers the question: **What can happen?**

More importantly: **What will happen?**

With rapid modeling simulation tools, companies have the power to maximize business processes and decision effectiveness using **simulation-based performance analytics** – a strategy deemed critical in [Gartner's Top 10 Strategic Technologies for 2010/2011](#).

Gartner defines **Simulation-based performance analytics** as: *Optimization and simulation using analytical tools and models to maximize business process and decision effectiveness by examining alternative outcomes and scenarios, before, during and after process implementation and execution. This can be viewed as a third step in supporting operational business decisions. Fixed rules and prepared policies gave way to more informed decisions powered by the right information delivered at the right time, whether through customer relationship management (CRM) or enterprise resource planning (ERP) or other applications. The new step is to provide simulation, prediction, optimization and other analytics, not simply information, to empower even more decision flexibility at the time and place of every business process action. The new step looks into the future, predicting what can or will happen.*

Gartner states: *It is becoming possible to run simulations or models to predict the future outcome, rather than to simply provide backward looking data about past interactions, and to do these predictions in real-time to support each individual business action. While this may require significant changes to existing operational and business intelligence infrastructure, the potential exists to unlock significant improvements in business results and other success rates.*

Gartner's reports put a spotlight on optimization and simulation, defining the best practices as using analytical tools and models to maximize business process and decision effectiveness.

**Analytics** exploits information to identify patterns, create possible change scenarios, make predictions about the future, and prescribe actions based on predicted results. Analytics is the key to successfully driving changes in people, processes, and business systems. This is done by using simulation to examine alternative outcomes and scenarios not only before but also during and after implementation and execution.

Analytics employs statistical methods to both draw conclusions from historical data, as well as the predictive power of simulation models to accurately predict future outcomes. Now more than

ever the predictive power of rapid modeling software is that essential capability that can help companies see the future and make informed decisions to gain a competitive edge.

With rapid modeling simulation tools, companies can use simulation modeling as an analytics tool for predicting what can or will happen as a result of decisions across the enterprise.

The role of simulation is expanding to exploit information and predict the impact of change at all levels of the business.

## **No Longer Just For Experts**

Although simulation modeling tools have been widely available for many years, their competitive impact has generally been limited by their complexity and the time required building useful models. In the past simulation modeling was limited to very select applications involving teams of experts. However this is no longer the case: simulation has now become a critical component of simulation-based performance analytics for successfully competing and winning.

A recent ARC Advisory Group Collaborative Production Management (CPM) Report, 2007, Market Forecast through 2011, Discrete Industries Worldwide Outlook, examined the use of simulation modeling in discrete industries worldwide. The conclusion?

"In the near future, modeling and simulation will represent a new way of doing business."

### **ARC Advisory Group Collaborative Production Management (CPM) Report, 2007**

The report contends that because of its importance to business, modeling and simulation will soon move away from being a practice that is exclusive to experts. Simulation and modeling will become a "ubiquitous collaboration tool for non-technologists such as managers and operators who make everyday production, operational and business level decisions."

The key to unlocking this power is the advent of new and powerful rapid modeling simulation tools that allow realistic 3D models to be quickly built and run by non-technologists. Simulation tools of the past are not designed or equipped to work in this environment. These new tools must support rapid modeling and easily and flexibly interface to a wide range of enterprise data that is typically held in spreadsheets, data bases, or ERP systems. These tools must also make it easy to define and properly evaluate alternatives without requiring sophisticated knowledge of statistics. An finally, these tools must go beyond the traditional use of simulation for comparing alternative designs and directly support the use of models within an operational setting to improve the everyday production, operational, and business level decisions that are key drivers to the overall success of an organization.

**About the Author:** C. Dennis Pegden, Ph.D. Simio LLC founder and CEO. Dennis led the development of the SLAM, SIMAN, Arena, and Simio simulation tools. He co-authored three simulation textbooks and has published papers in a number of fields including scheduling and simulation.