



## *Analytics Response to COVID-19 Crisis Using System Dynamics: A Business Flight Simulator*

Uncertainty due to COVID-19 makes that some corporations are focusing on near-term for survival as the only item in their agenda while others are looking forward to trying to understand how to position themselves once the crisis has passed and things return to normal. The question is, “What will normal look like?”.

In this unprecedented new reality, we are witnessing a dramatic restructuring of the economic and social order in which business and society have traditionally operated. On one side, no one can say how long the crisis will last. On the other, it is difficult to understand how this crisis is changing the way people behave and how this change will transform individuals as consumers. Here, we attempt to answer the question being posed by leaders across the public, private, and social sectors: What will it take to navigate this crisis, now that our traditional metrics and assumptions have been rendered irrelevant?

In the COVID-19 response, the first task for organizations was, of course, identifying the new business challenges that emerged overnight. To that end, many companies stood up central nerve centers, mobilizing business and analytics resources to inform and address these challenges by building new data streams, reporting on business-critical issues to guide near-term decisions, and developing longer-term views of data to understand what the future may hold for their company, customers, and suppliers.

Some companies have started answering all these questions analyzing future evolution of scenarios and knowing that the decisions they are making today may alter the company’s trajectory for years to come. When navigating these uncharted waters, where the tides continue to shift, there is a need to make a great effort to create a set of tools to understand and quantify the connection between three critical areas: scenario evolution, company’s strategic and tactic decision making and expected results on key performance indicators. In this situation, it’s not surprising that mathematical modeling and analytics, widely recognized for its problem-solving and predictive prowess, has a key role to play to bring rational and foundation to navigate with a robust roadmap under these uncertainty times. Analytics could support the understanding of numerous pieces of the business that are interconnected like forecasting demand, managing channel mix, pricing strategy, launching new value propositions, predicting customer behavior changes, assessing economic recovery speed, screening supply-chain disruptions, targeting support services to at-risk workers, and determining the effectiveness of crisis intervention strategies, to name a few.

Purpose is to set a tool that will allow any company to make the best set of business decisions in response of the variations of the environment of the company. These tools are based on **System Dynamics** which is a set of practical methods for systems thinking and dynamic modeling of complex systems, with applications to organizational learning and change, operations management, corporate strategy, and nonlinear dynamics in a wide range of systems. System Dynamics can be compared with flight simulators of corporate and economic systems. These flight simulators are used

to understand and improve managerial decision making in complex dynamic systems and environments; more importantly, they are now widely used by corporations for problem solving and decision making and policy design.

The goal of systems thinking, and system dynamics modeling is to improve company understanding of the ways in which its performance is related to its internal structure and operating policies, including those of customers, channels, competitors, and overall value chain, and then to use that understanding to design policies to successfully beat the market.

Effective decision making and learning in a world of COVID-19 uncertainty and growing dynamic complexity requires company's executive and management team to become systems thinkers to expand the boundaries of their paradigms and mental models and develop tools to understand how the structure of complex systems creates better decision making processes.

When modeling with this methodology the most important thing is problem articulation: what are the set of issues the system will try to simulate and respond? And what is the purpose of the model? Typically, the purpose of the model is to optimize the strategic thinking and operational decisions that the company must take depending on the predicted evolution of the environment and also the expected results measure with a set of predictive key performance indicators. In addition, we will analyze system dynamics of the historic correlation between environment, decisions and results as a matter to enrich our understanding of company's dynamics in the previous "normality".

Headquartered in Boston, Altair is a consulting boutique that masters in assembling strategic vision, analytical skills, and business transformation experience to deliver Enterprise Analytical



Management (EAM) to corporations helping them become an "analytical company." But what is an "analytical company"? It is a company that has captured all value at stake by fully embedding analytics in their value chain. As an example of our analytical portfolio, we have experience in developing system dynamics meaning to develop tailor-made "company flight simulators" to allow a company making continuous simulations and enabling better decisions among these unprecedented times. Altair helps companies to achieve these capabilities seamlessly.

*Juan-Carlos Martínez, Founder & President*  
Boston, July 30, 2020