**Why Embrace Optimization and Prescriptive Analytics?**

If you have not heard about or read articles or blogs about Big Data and business analytics until now, then welcome back from the coma you were apparently in the last couple of years. For the rest of you, who of course are the vast majority, do you have the same nagging question that I have?  “Is Big Data and business analytics such a big deal that if our organization is late to the party deploying them, then we will never catch up to our competitors that have deployed them?”

**Which type of capability is more critical? Management methods or analytics?**

I personally go back and forth on wondering if applying analytics now is an urgent imperative for an organization to survive or if it is a “nice to have” relative to other more critical “must have” capabilities that an organization should ideally possess or need to improve them. An example of a critical capability is integrated business planning (IBP) to support decisions.

In my opinion critical capabilities involve modeling methods and prescriptive analytics. However, a case can be made that there is a sufficient competitive edge from simply using traditional commonly accepted managerial improvement methods without needing modeling and analytics tools. Organizations can rely on standard methods like lean management, six sigma quality, and dashboards with key performance indicators (KPIs). But can those methods provide a sustaining competitive edge?

A reason that part of me speculates that applying modeling methods that aspire for optimization is not so urgent today is by simply reflecting on my own career. I graduated over forty years ago in 1971 with a B.S. degree from Cornell University in industrial engineering and operations research. I was going to go out into the world and optimize everything. Back then the world was a big machine to me, and we simply needed to fine-tune its pulleys, levers, gears, and dials to maximize performance and results.

But I had a rude awakening. Business and government was not ready then to embrace the mentality of optimization derived from having a strong analytics capability. The problems were not complex enough, the need for significant improvement was not sufficient, and the computing power was not adequate in those times. So my skepticism of the urgency for modeling and prescriptive analytics with optimization is based on doubt formed by my lengthy career since most companies have gradually improved without these capabilities.

**How much things have changed**

Now I will change my tune from skeptic to advocate regarding the urgent need for modeling and prescriptive analytics capabilities leveraging optimization.

I am rapidly recognizing that embracing optimization is becoming an imperative for successful organizational performance. The majority of professionals today grew up with computers and digital devices. They understand this imperative. They embrace the need for modeling and prescriptive analytics. They possess passionate brainpower combined with the maturing and acceptance of modeling and Big Data. The imperative involves the current challenge all organizations have on how to cope with the five “Vs” of Big Data: volume, variety, velocity, viability, and value.

Most professionals prefer to rely on gut feel, intuition, and experience for making decisions. Fortunately today there are increasingly fewer of them since most rising managers are tech-savvy and prefer fact-based decision making by leveraging quantitative information.

My shift to recognizing the compelling need and urgency to embrace modeling, prescriptive analytics, and optimization was reinforced when I recently attended a conference of the Institute for Operations Research and Management Science (INFORMS.org) on business analytics and operations research. Attendance at the conference doubled to 800 from the prior years. That alone provides evidence. However, there were also roughly 125 presentations and 72 poster board displays. All of them were a combination of being inspirational, mind-numbing, and visionary. They demonstrated, and more than you can imagine, the extensive reach and feasibility of applying analytics, modeling, optimization and Big Data to a wide variety of problems and solutions in every industry and public sector. Here are just a few examples:

* Supply chain management profitability maximization
* Solar and wind farm energy optimization
* Dynamic airline re-scheduling due to weather or maintenance delays
* Hospital patient flow forecasting; Nurse scheduling
* Debottlenecking manufacturing production flows
* Dynamic antiviral treatment to prevent a global pandemic influenza
* Intermodal truck and rail route profit optimization
* Optimal bank loan credit scoring
* Maximizing return on investments (ROI) from marketing campaigns
* Assortment planning and optimization in a retail store
* Using social network data to predict customer churn
* Slot machine optimization in casinos

You get the idea. If it is complex with lots of data and a goal or objective to maximize, minimize, or optimize, then the capability day for optimization has arrived. Modeling is essential to effectively framing the problem, devising the solution, making decisions, and taking actions.

If you are a CFO or CEO, then consider the impact these numbers may have on shareholder value:

* Increasing profitability by up to 5% of revenue
* Identifying more opportunities to drive growth with the existing capital and asset/resource base
* Reducing use of capital by up to 10%
* Increasing business agility to plan and make decisions/react to events by 50%
* Improving financial forecast accuracy by up to 30%

C-levels that have deployed prescriptive analytics on a company-wide basis will agree it not only has doubled or tripled their shareholder value, but it has also given them a unique competitive advantage by spreading knowledge and moving faster than the competition.

**Note to reader – Get on the bus or be under the bus**

Throughout my career I have been an active and loud advocate, even cheerleader, for deploying the integrated business planning methods. I still do make noise about their high value and nag organizations who still use primitive pre-cursors (e.g., management by objectives, standard cost accounting, and quality management).

However I now choose prescriptive analytics and optimization capabilities as more critical than traditional capabilities. Part of my reasoning is that I now see solid evidence, no longer just aspirations, of the realization of applying operations research methods to a very broad range of problems. I myself am now getting pumped up – excited. It’s here. Optimization can be done. *Moneyball*. Synchronizing street traffic lights. Altering the trajectory of an earthbound civilization threatening asteroid. Scheduling production orders to optimize sales, profits, or asset utilization. Choose your own desired application for prescriptive analytics.

It is no longer a dream. It is no longer theory. Prescriptive analytics and the impact of the existence of Big Data is the real deal. The type of managers, hopefully only a few, who do not embrace having a strong quantitative capability will risk the consequences of being classified as Medieval. The world is no longer flat.