The Answer . . .

The Right Question

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"Understanding the Question is Half the Answer"

Socrates

The ability to see, understand, and ultimately know what is necessary to achieve success represents a vital element in making wise decisions. This ability is fueled by data, which enables the discovery of options that can overcome problems and disclose opportunities that fulfill the objectives at hand. Thus, as our appetite for information grows faster than the data being amassed, it is unsurprising that demand for data is accelerating.

While we are undoubtedly familiar with Moore’s Law, which holds technology evolves every 18 months, few of us realize that Buckminster Fuller’s “Knowledge Doubling Curve” is at the core of that law. Fuller asserted that while knowledge doubles every 12 months, that interval would eventually be compressed to 12 hours. That insatiable thirst for knowledge drives demand for data, now referred to as “big data,” which doubles every 2 years.

The ability to internalize such copious amounts of information and conceptualize the interdependencies within this complex environment is an effective metric for gauging an individual's ability to derive strategic advantage from their efforts and master their environment. By extension, the ability to compare one's starting point to the intended destination facilitates an appreciation of the vector and character of those elements and an understanding of how they can influence expected outcomes.

Today’s Volatile, Uncertain, Complex and Ambiguous (VUCA) environment makes it imperative to weigh the origin and contributing reference points against the available options and opportunities to ascertain deterministic potential and the resulting variances. After gaining some context, the information substantiated by the associated data will explain how we arrived at our current situation. Historically, the rate at which data becomes available and is linked contextually to our understanding of cause and effect will impact on the potential and probable effects of actions taken to influence the environment. These actions will undoubtedly affect the overarching outcomes.

In today’s globally interlinked environment, the rate at which data is produced (and the interdependencies inherent in that information) contributes to a complex, fast-paced world. In such an environment, arriving at the right answer faster than the competition demands that high-quality data—big data—be available at the right place and time and reflect an awareness of the overall situation. That way, such data can be used to develop a clear, cohesive picture of actions taken relative to the desired results. The building block needed to mature the historical data used to augment a particular Frame of Reference (FOR) (*used in turn to organize and structure data into information by applying sound Data Resource Management processes*).

Historical FOR informs our current state, which has been modulated over the last 20 years by the steadily increasing mass and complexity of data. As a result, data must now be viewed as a strategic asset and be managed accordingly to ensure our ability to extract its inherent value. By doing so, such data can be organized effectively and correlated into information that will bolster our overall understanding. This process can be utilized to ascertain the probable veracity of the data and the means by which it can be brought to bear, to illustrate the predicted outcomes contextually (as illustrated below).

Structuring and transforming this growing mass of complex data into information is vital, as it will provide the clarity needed to make informed decisions. To appreciate the value of big data and use it to our advantage, itmust first be organized and structured. This can only be accomplished through strong DRM practices implemented by Data Stewards (DS) and Information Managers (IM), which will ensure the data is fit for its intended purpose.

Given the growing dependence on the depth and breadth of data's strategic value, data hubs are essential for identifying where the data is, how it can be accessed, and for ensuring that it is Visible, Accessible, Understandable, Linked, and Trustworthy (VAULT). The criticality of a supremely capable data services unit within the organization will ensure that practical business intelligence is available to determine the credibility, confidence, and trustworthiness the organization can reasonably expect of its data.

Our alignment of data assets with the foregoing imperatives, identification of potential interoperability conflicts, and establishment of the basis for practical and cross-organizational discussions will combine to ensure that data services units meet the overarching organizational goals that satisfy mission imperatives. Thus, one of our strategic imperatives must include taking a holistic approach to harvesting the inherent value of data and the associated information upon which the organization has become dependent.

We derive value from knowledge by determining the VALUE of data by assessing its *V*eracity (quality), assessing our reliance on Access to that data, improving its resilience by creating a network of linkages, and expanding our situational awareness to enhance and expand our Understanding and ability to evolve in this VUCA environment.

This iterative, five-step VAULT process of putting data into action and unleashing the power of information (VALUE) is a progressive approach to establishing a Data-Driven Organization (2DO). Thus, the 5Ps and 5Cs of Collecting data to accomplish Prescriptive modeling, correlating its Structure with information that illustrates its Probabilistic qualities to identify its Contextual Potential accurately, will disclose the Consequences of the actions we take to Predict the best course of action. By taking an interactive approach, we can collect, Catalog, Correlate, Contextualize, conduct Cost/Benefit analyses, characterize, advance C2, communicate, and determine Causality and Consequences (10C) as illustrated inthe chart below.

This core allows us to build the foundation upon which we can validate what we understand, answer unknowns, and explore the unknowable constructively and progressively. In scientific terms, we must establish a prescriptive model of lessons learned from past actions compared toactual outcomes. This will enable us to verify the FOR paradigms that enhance one's perceptions and/or improve Situational Awareness (SA) (outlined in my work on evolving knowledge into understanding, available at http://www.dtic.mil/dtic/tr/fulltext/u2/a530070.pdf).

In our effort to make good decisions, we must be willing to use a cognitive approach that enhances our understanding and allows us to embrace failure courageously to learn. These qualities are fundamental to the skyrocketing interest in Artificial Intelligence and Machine Learning. While today's focus on analytics centers on answering questions, that focus could be refined to help us better understand our circumstances vis-à-vis today's rapidly evolving information environment—one that is pushing us quickly toward the age of knowledge.

We would indeed benefit by adapting John Boyd's OODA Loop framework in our efforts to Access, Characterize, and Evolve the strategic advantage we could gain by applying all aspects of the information available to us. Moreover, it is critical that we harvest the inherent VALUE of information by Accessing (*the veracity*), Characterizing (our awareness), and Empowering(*evolving toward*) (ACE) our understanding of today's interlinked information environment.

The science of structuring data and deriving probabilistic computational modeling from its associated FOR via data scientist-administered prescriptive modeling will help establish a sound DRM foundation. Such an infrastructure will give IMs the means to advance SA based on information that conveys and influences knowledge. Here, strategic trade-offs allow Knowledge Operators (KOs) to identify potential and probable outcomes using Artificial Intelligence (AI).

Ultimately, we should be able to predict outcomes or consequences, evolve, and learn thanks to rigorous analytical analysis and coherent ML processes. It is through an interactive process of learning and change that we derive competitive advantage. By building on past successes, learning from current failures, and seeking and exploring solutions, the application of agility offers the opportunity to adopt and overcome even the most significant challenges.

In today's highly competitive environment, organizations rely on big data to mitigate risk. Unfortunately, the result is a risk-averse environment that does not tolerate bad decisions. Though we should consider failure as just another opportunity to learn, we typically do not choose to learn from our mistakes, which forces us to repeat them.

Without understanding the linkages and interdependencies of information, we cannot develop knowledge to the level that allows us to identify the antecedents and consequences of our actions. Clearly, we are poorly equipped to characterize the environment and determine our potential for success. Further, the growing mass and complexity of data in today's information environment compound this situation.

Currently, data professionals help enable sound decisions by consulting the 20/20hindsight of our FOR. In short, such actions imbue our SA with current knowledge, allowing us to identify informed options and opportunities in the future state. These actions will enable us to replace reactive measures with proactive responses that advance our organizational objectives.

By using a structured approach, we can identify, mature and establish the reliability of data to build credibility and confidence in the information we mature, which then can be used to paint a contextual picture of understanding. Ultimately, we must cease our reactionary post-event responses and use a far more proactive approach by taking actions that transform our environment to suit our needs.

Most importantly, the ability to think, learn, evolve, and grow ensures we can transform our environment to accommodate current and future objectives. We have the opportunity and ability to influence our environment and convert it according to our own design. Thus, by exploring the art of the possible as defined by the science of the probable, we can empower our leaders to accomplish their goals and fulfill their mission objectives. It is therefore imperative that a new approach and perspective be adopted in this rapidly changing environment.

We must advance and advocate a visionary approach that helps us overcome the self-imposed constraints that force us to live in the problem and instead focus on seeking solutions. This shift will require us to take a proactive stance by centering our efforts and energies on exploring options to become enlightened about the available opportunities to understand our environment… by asking the right questions.