SYSTEMS MODELING AND SIMULATION (SMS)

The Solution Approach

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SMS_ThinkTank™ LLC is the global resource and leader in systems modeling and simulation, bringing the worlds of systems engineering and computer aided engineering together.

Systems Modeling and Simulation (SMS)
The Solution Approach

The market today is characterized by faster than ever changing and evolving technologies across all industries. This becomes evident by the drastically increased complexity of consumer products, their systems and the environments in which they operate. This evolution is supported by the digitalization of science and engineering as well as the need for upfront predictive capabilities to deliver on improved product quality, robustness guarantees and certification. An additional major drive for the market is change towards an "experience-driven" economy / society where the consumer demands much more flexibility and choices – the time that "one size fits all" is gone.

Major technology catch phrases for this fast-paced environment are:

- Model-centric Engineering (3D and other fidelity level models)
- Model-based Engineering and Enterprise
- Model-based Systems Engineering
- Model-based Design
- Big Data
- Internet-of-Things and Industry 4.0
- Digital Twin and Digital Thread
- Cognitive Engineering

This is an extreme competitive challenge for all industries. OEMs and suppliers need to remain competitive, and to accomplish this a systems engineering approach to product and process development and engineering should be adopted to satisfy customer demands.

Innovation is a key differentiator. Companies define their market position by the way they capture, work with and deploy data as a major key asset and what cultural behavior they demonstrate in their day-to-day operation. Innovation leaders realize that accurate and accessible data is the foundation for insight and inspiration. They make use of data, derive knowledge from this data in real-time (or close to it) and execute upon it. This is what we call "Innovating at the Speed of Thought". (Figure 1)
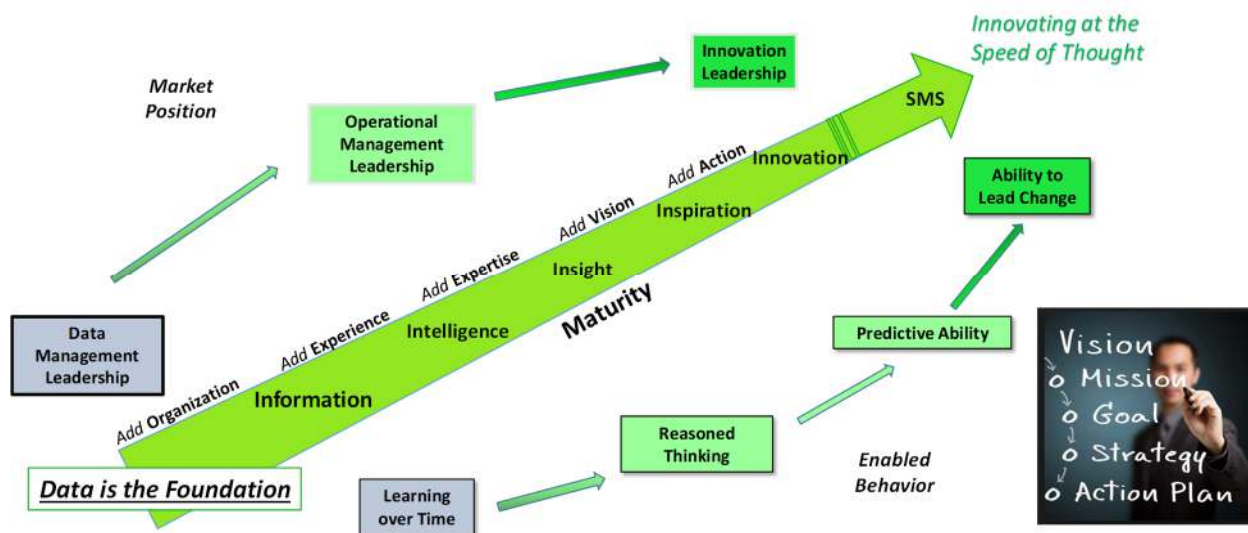

Figure 1: Innovating at the Speed of Thought

Companies need to understand at what level of innovation maturity they operate in order to be and stay competitive, thus sustaining their business for the long haul. Leaders that are operating at or are approaching the innovation maturity level of "System Innovation" are in a much better position to

understand and anticipate the needs of their customers, increase their market share and are in enviable positions to disrupt the market. (Figure 2)
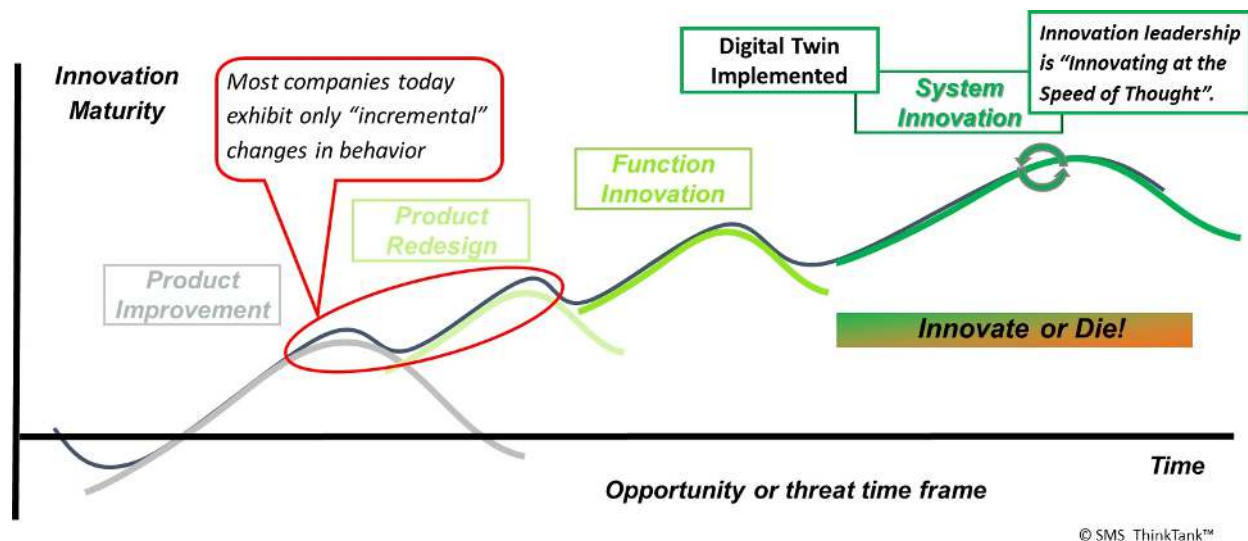

Figure 2: Achieving Sustainable Innovation

Business Consulting Offerings

The SMS_ThinkTank™ was developed to provide systems modeling and simulation business solutions to help OEMs, suppliers, academia and government organizations navigate through the difficult tasks associated with the adoption of systems engineering methods and best practices in their overall business environment. Our goal is to enable these organizations across all industries to achieve sustainable innovation and become leaders in their fields. Therefore, we offer business consulting, which includes:

- ➢ **Systems Engineering and its related Domains Readiness / Maturity Assessments**
  - o Enterprise and Department Level Engagements
  - o Our developed maturity models follow the CMMI principles
  - o The approach covers the high-level categories
    - ▪ Organization / Culture / People
    - ▪ Process
    - ▪ Technology
  - o Our process analyzes the following states of a company / organization / entity:
    - ▪ As-is
    - ▪ To-be
    - ▪ Gap

- ➢ **Silo Reconciliation and Collaboration**
  - o Identification of Issues between Silos
  - o Gap Analysis
  - o Effective Communication
  - o Process Optimization
  - o Identification of Cross Discipline Integration Points
  - o Cross Discipline Inputs and Outputs

- ➢ **Recommendations for optimized business structure and technology deployment**
  - o Strategy development
  - o Roadmaps development
  - o Decision making support
  - o Deployment and roadmap execution support

- ➤ **Governance support**
  - o Define structure needed for the business / organization
  - o Support the establishment of the specific governance body and processes
  - o Shadowing / supporting the activities to provide ongoing guidance

- ➤ **Support during new process and technology introductions / rollout**
  - o Pilots
  - o Internal projects
  - o Supporting engagements to ensure customer requirements are met

- ➤ **Systems Engineering Training and Education (develop and host)**
  - o Executive level
  - o Manager level
  - o Subject Matter Expert
  - o End user

Our **engineering consulting engagement** focuses on following areas:

- ➤ **Virtual engineering:**
  - o CAE
  - o Systems Engineering
  - o Systems Modeling and Simulation
  - o Model-based Systems Engineering (MBSE)
  - o Verification and Validation
  - o Physical testing
  - o Manufacturing (including lean manufacturing, FMEA and related areas)
  - o Digital Twin
  - o Analytics
  - o Engineering IT

- ➤ **Fields covered:**
  - o Model-centric Engineering
  - o Model-based Engineering and Enterprise
  - o Model-based Systems Engineering
  - o Big Data
  - o Telematics
  - o Internet-of-Things (IoT), Industrial Internet-of-Things (IIoT) and Industry 4.0
  - o Digital Twin (including maturity throughout the lifecycle based on application areas and related ecosystem)
  - o Digital Thread and Business Innovation Environment
  - o Cognitive Engineering

- ➤ **Market Research:**
  - o Industry Trends
  - o Competitive Analysis
  - o Surveys
  - o Technology Research