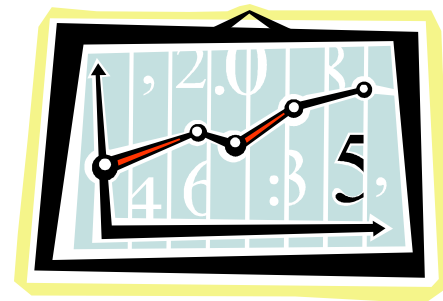


# ***Adopting SysML™***

*ARTiSAN Software's  
Perspective on  
Industry Adoption of SysML™...*



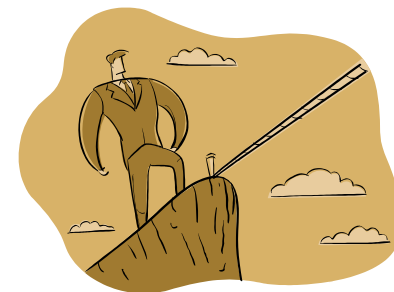
- **Everett Rogers and Innovation Adoption [1962, 1983]**
  - Two crucial adopters drive successful technological innovation:
    - **Venturesome Innovators [First 2.5%]**
    - **Respectable Adopters [Next 13.5%]**
  
- **Reference:**  
<http://www.zonalatina.com/Zldata99.htm>



- **Obsessed with venturesome-ness**
  - desires the hazardous, the rash, the daring, and the risky...willing to accept setback when adopted new ideas prove unsuccessful...may not be respected by the other members of a social system...launches new ideas into the social system...plays a gatekeeper role...
- **Eager to try new ideas**
  - leads them out of local peer networks and into more cosmopolitan social relationships. Communication and friendships among a clique of innovators are common, even over considerable geographical distance.
- **Controls substantial financial resources to absorb the possible loss owing to an unprofitable innovation**
- **Able to understand and apply complex technical knowledge**
- **Able to cope with high uncertainty about adopted innovations.**

# ARTiSAN's Venturesome MBSE Innovators

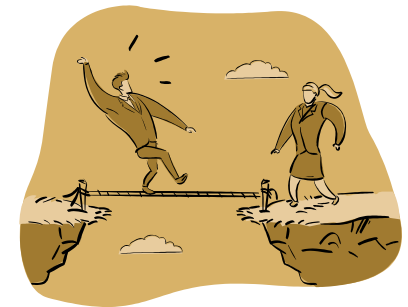
- Circa 2000
- Using ARTiSAN Studio<sup>®</sup>, UML<sup>™</sup>, and SysML<sup>™</sup> before these capabilities were “respectable”
- Airbus
- BAE Systems
- Bosch
- EADS
- Johns Hopkin APL
- Lockheed Martin [SI, MSFC]
- Northrop Grumman [ES, MS, DSD]



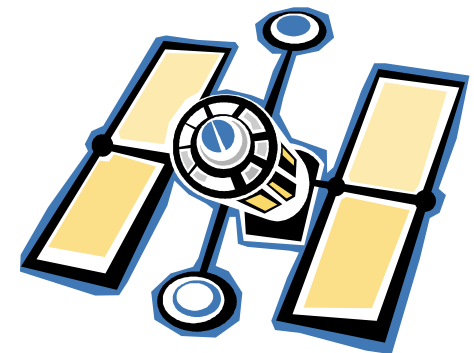
- ...a more integrated part of the local social system...
- Not Cosmopolites but “Localites”
- Provides greatest degree of opinion leadership in most social systems.
- Potential adopters look to Early Adopters for advice and information...
- Considered to be the “one to check with” before using a new idea.
- Sought out to be a local missionary for speeding the diffusion process.
- Near the average in innovativeness, they serve as a role model for many others
- Respected by peers...the embodiment of successful and discrete use of new ideas.
- To continue to earn esteem of colleagues and to maintain a central position in the communication structure of the system...must make judicious innovation decisions.
- Decrease uncertainty about a new idea by adopting it, and conveying a subjective evaluation of the innovation to peers

# ARTiSAN's Respectable MBSE Early Adopters

- Circa 2007
- Using or Considering ARTiSAN Studio® and SysML™ in response to positive feedback from the Innovators
- Additional Project Teams within aforementioned
- Alenia Aermacchi
- Booz Allen Hamilton
- NASA [JPL, Glenn]
- Rolls Royce
- Selex-SI



- Aerospace
- Defense
- Transportation
- Systems Integration / Mission Systems



- **Customer Characteristics**
  - Audit Constraints
  - Critical Systems
  - Enterprise Systems
  - Heterogeneous Systems
  - Financial Wherewithal
- **Popular SysML™ Constructs**
  - «Requirement»
    - **Diagram and Traceability**
  - «Block»
    - **BDD and IBD—but much confusion over Ports**



- **Positive Aspects**
  - “Finally, an engineering language for Systems Engineering”
  - “Thankfully, not Software-biased”
- **Issues and Concerns**
  - Lack of Support for Tradeoff Analysis
  - Lack of Instance Specifications
  - Lack of Formal Action Specification Language
  - Lack of in-situ mathematical interpretation
  - Lack of Temporal Modeling
- **Opportunities for Academic Research**
  - Modeling, Dynamics, and Simulation Integration
    - **Constraint Object Blocks**
    - **Parametrics**
    - **MatLab/Simulink**
    - **Modelica**
  - Researching and Reporting Successful, Practical Usage

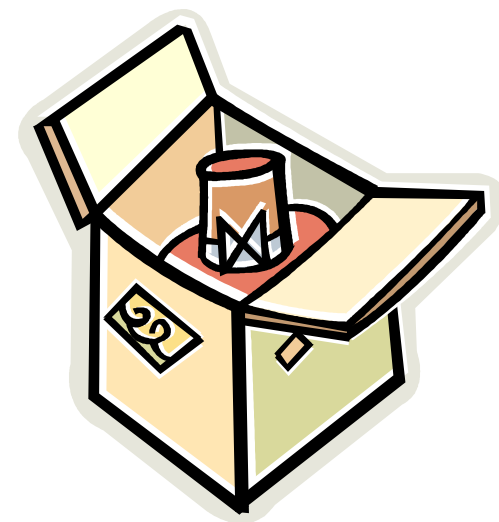
- **Providable by Consortia such as INCOSE and OMG™**
  - Integration with UPDM, Profile for Test, MARTE
  - Vendor-neutral Introductory Training
- **ARTiSAN Recommendations**
  - Formal Action Specification Language
  - Integration of Instance Specifications
  - Functional coupling with Dynamics and Simulation tools
  - Workflow Integration
  - Publication of Case Studies
    - **Both Good Patterns and**
    - **Anti-Patterns of Usage**



- **Capabilities Well Covered**
  - Structural Hierarchies
  - Behavioral Hierarchies
  - Operational Views
- **Capability Gaps**
  - Model Reviewer Navigation
  - Viewpoints and Views
  - Execution Semantics of Activity Nodes
  - Temporal Formalisms for Temporal Systems
  - Tradeoff Analysis
  - Economic, Reliability, Safety, and Security Analysis and Modeling



- Agent Modeling
- Business Process Modeling
- Human Factors Engineering
- Reliability Engineering
- Space Systems and  
Space Missions Systems
- Systems Views of  
Architecture Frameworks



- **Lonnie VanZandt**
- **ARTiSAN Software Partner; ARTiSAN Studio® user since 2000**
- **Independent Consulting Systems Engineer (Predictable Response Consulting) since 2000**
- **Specialties include: Operating Systems kernels, Real-time Systems, Object Oriented Systems, Network Protocols, UML™ and SysML™ Modeling, ARTiSAN Studio® Usage, Together© Usage**
- **Career includes: AT&T Bell Labs, TimeSys Linux, Northrop Grumman {Cleared}, DesignNet, ...**
- **Education: BS and MS, Computer Engineering, University of Illinois, Urbana**

# *Opinions Disclosure*

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