

# **National Defense Industrial Association Systems Engineering Division Modeling and Simulation Committee**

## **Digital System Model Workshop Potential Taxonomy for Digital System Model Data**

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**410-440-2425**

# Presentation Outline

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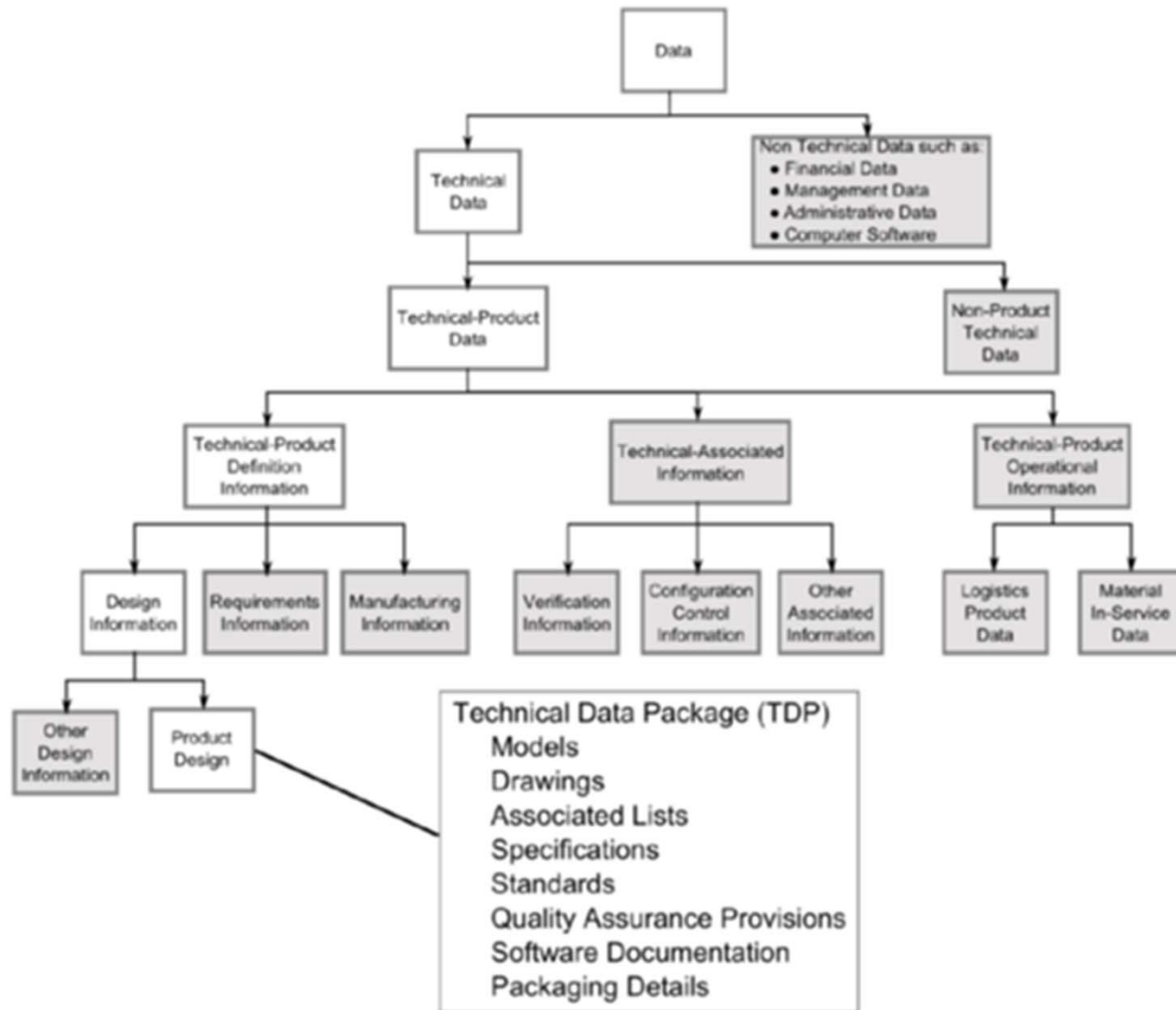
- **Motivation for a Data Taxonomy**
- **System Data Taxonomy Sources**
  - **Technical Data**
  - **Non-Technical (Financial) Data**
- **Non-System Data Taxonomy Sources**
- **Relationship to Collaborative M&S Environments**
- **A Suggested Overarching Taxonomy for System Data**
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## Motivation for a Data Taxonomy

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- **Sustainment activities can benefit from data generated earlier in the acquisition life cycle**
  - If they know what data to ask for
- **Different communities may**
  - Use different terms to describe the same data
  - Use the same term to describe different data
  - May be used to speaking at different levels of aggregation
- **There currently is no accepted unified taxonomy for all categories of data that are used in DoD system acquisition.**
- **A data taxonomy would assist different communities (e.g., acquisition and training) to develop a common understanding of system data.**

# MIL-STD-31000A Data Taxonomy



# Selected Sources of Information for Technical Data Categories

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- **MIL-STD-31000A**
- **DI-SESS-80776A**
- **Defense Acquisition Guidebook**
- **ISO 10303**
- **GEIA-927-A**
- **GEIA-STD-0007-B**

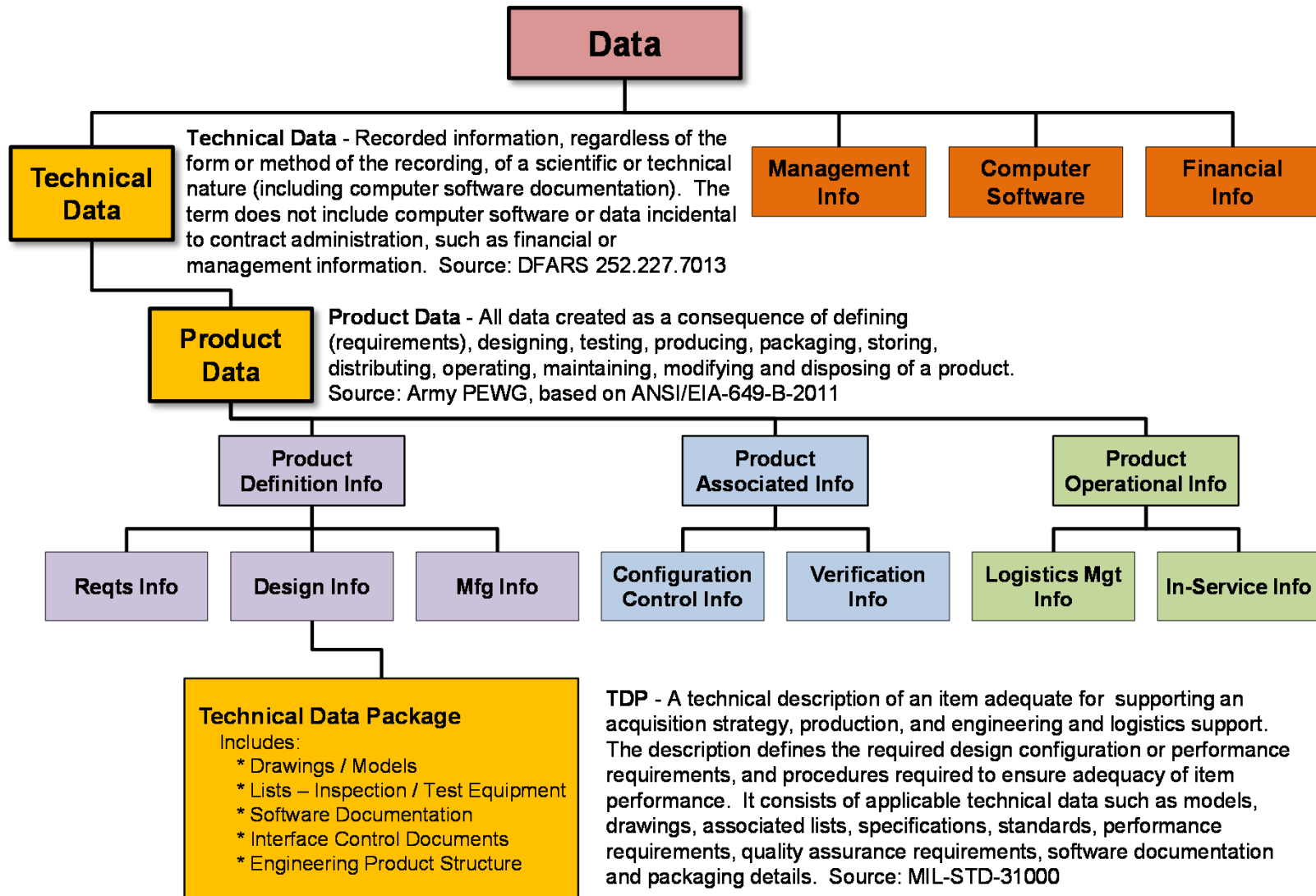
**For the most part, both DoD guidance documents and industry standards focus on “system characteristics” data rather than “system performance” data.**

# Elements of a Technical Data Package

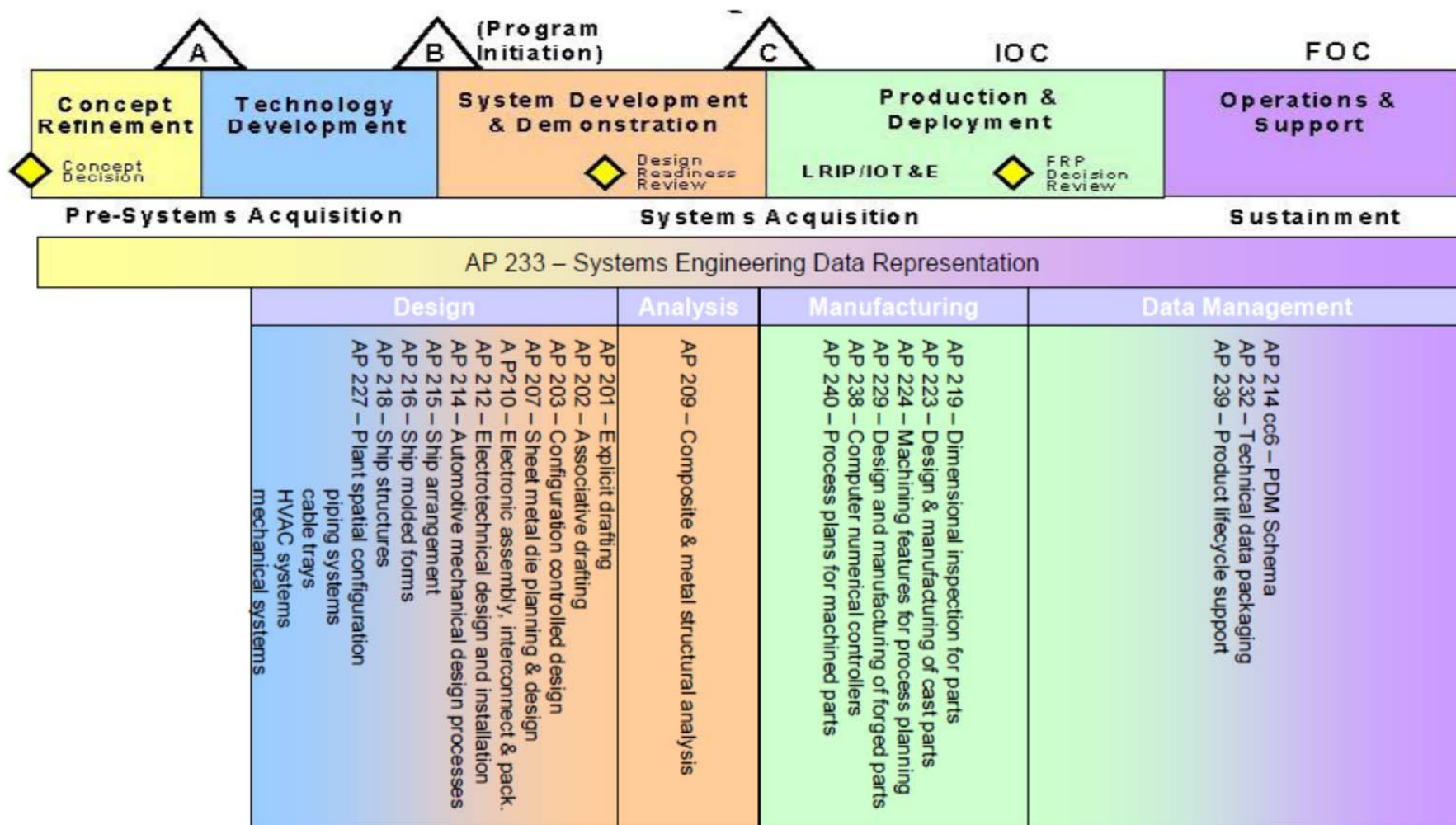
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- **Conceptual design drawings/models**
- **Developmental design drawings/models and associated lists**
- **Production drawings/models and associated lists**
- **Commercial drawings/models and associated lists**
- **Special Inspection Equipment (SIE) drawings/models and associated lists**
- **Special Tooling (ST) drawings/models and associated lists**
- **Specifications**
- **Software documentation**
- **Special Packaging Instruction (SPI) documents, drawings/models and associated lists**
- **Quality assurance provisions (QAP)**

# Defense Acquisition Guidebook Data Taxonomy



# Mapping of STEP Application Protocols to the Acquisition Life Cycle



Source: “Applications of the STEP AP 233 Systems Engineering Information Model,” C. Stirk and D. Price, NDIA Systems Engineering Modeling & Simulation Committee, June 2009.

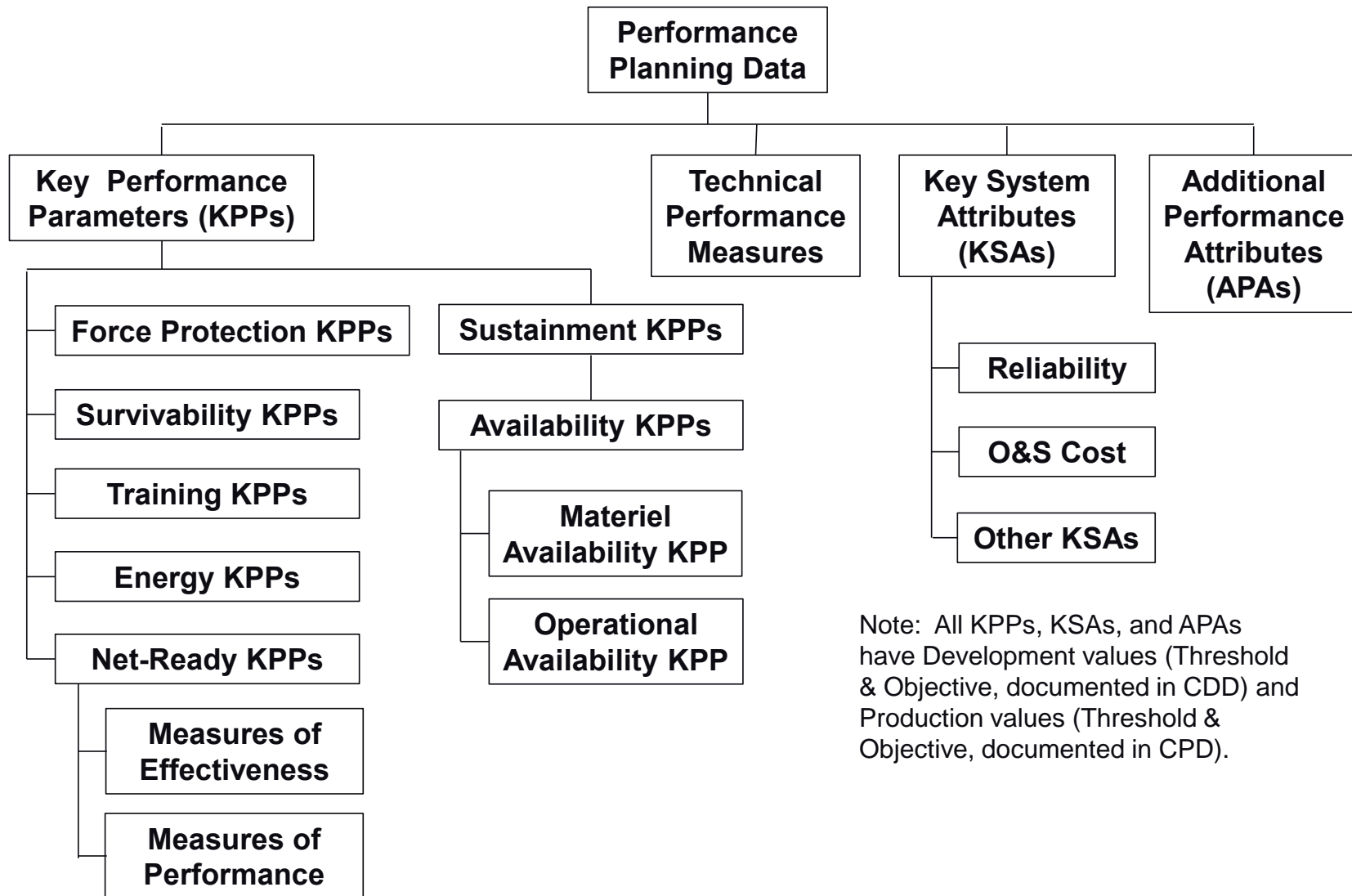


# **Core Manufacturing Simulation Data Standard**

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- **Approved as a Simulation Interoperability Standards Organization (SISO) standard, spring 2010**
- **Utilizes Unified Modeling Language (UML) class and package diagrams**
- **CMSD information categories:**
  - **Calendar information**
  - **Resource information**
  - **Skill information**
  - **Setup information**
  - **Part information**
  - **Bill-of-materials information**
  - **Inventory information**
  - **Process plan information**
  - **Maintenance plan information**
  - **Order and job information**
  - **Schedule information**
  - **Reference information**
  - **Probability distribution information**

# Performance Planning Elements from JCIDS



# Operations and Support Cost Data Taxonomy

## 1. Unit-Level Manpower

- 1.1 Operations
- 1.2 Unit-Level Maintenance
- 1.3 Other Unit-Level

## 2. Unit Operations

- 2.1 Operating Material
- 2.2 Support Services
- 2.3 Temporary Duty

## 3. Maintenance

- 3.1 Organizational Maintenance
- 3.2 Intermediate Maintenance
- 3.3 Depot Maintenance

## 4. Sustaining Support

- 4.1 System Specific Training
- 4.2 Support Equipment Replacement
- 4.3 Sustaining Engineering and Program Management
- 4.4 Other Sustaining Support

## 5. Continuing System Improvements

- 5.1 Hardware Modifications or Modernization
- 5.2 Software Maintenance and Modifications

## 6. Indirect Support

- 6.1 Installation Support
- 6.2 Personnel Support
  - 6.2.1 Personnel Administration  
(Personnel Acquisition ,  
Individuals Overhead Accounts)
  - 6.2.2 Personnel Benefits  
(Family Housing, Commissaries,  
Child & Family Support, DoD Schools)
  - 6.2.3 Medical Support
- 6.3 General Training and Education
  - 6.3.1 Basic & Initial Skill Training
  - 6.3.2 Educational Activities

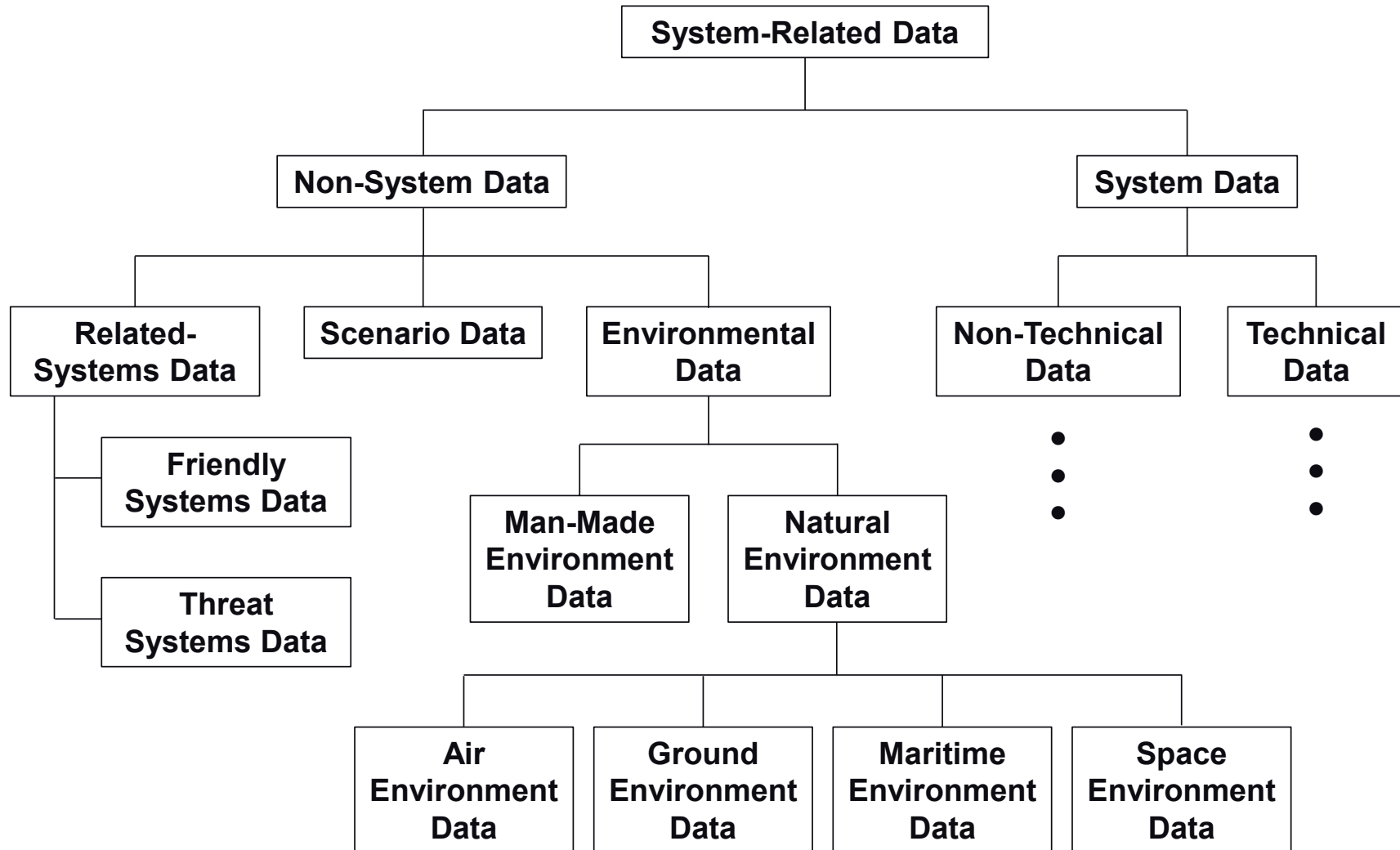
Source: Operating and Support Cost-Estimating Guide, Office of the Secretary of Defense Cost Analysis Improvement Group, October 2007

## **Selected Sources of Information for “Non-System” Data Categories**

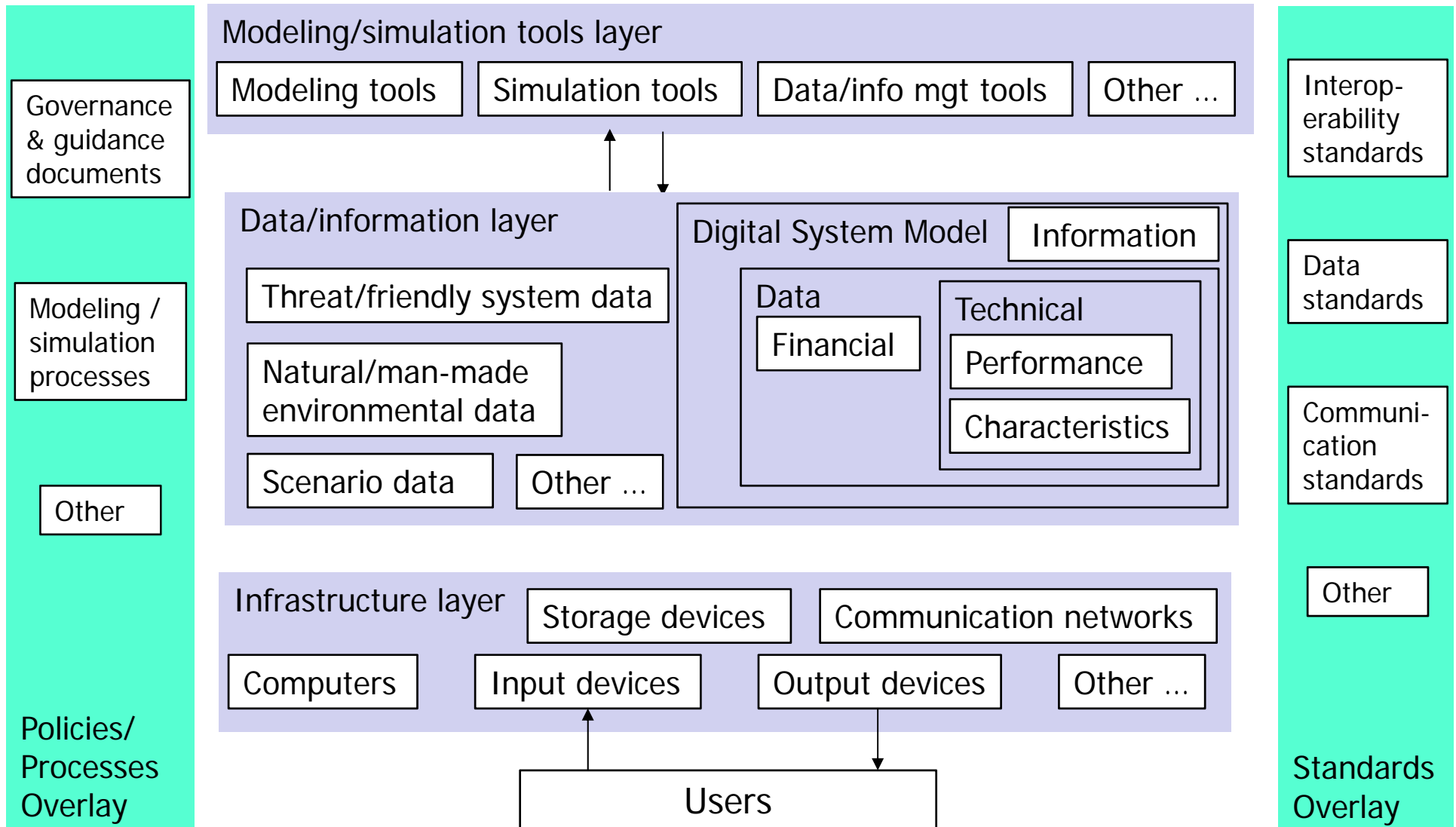
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- **M&S Collaborative Environment Instances**
  - **Simulation Based Acquisition Roadmap (1998)**
  - **JSF Strike Warfare Collaborative Environment (2000)**
  - **FCS Advanced Collaborative Environment (2002)**
- **SEDRIS Standards**
- **DoD M&S Environment Agent structure**

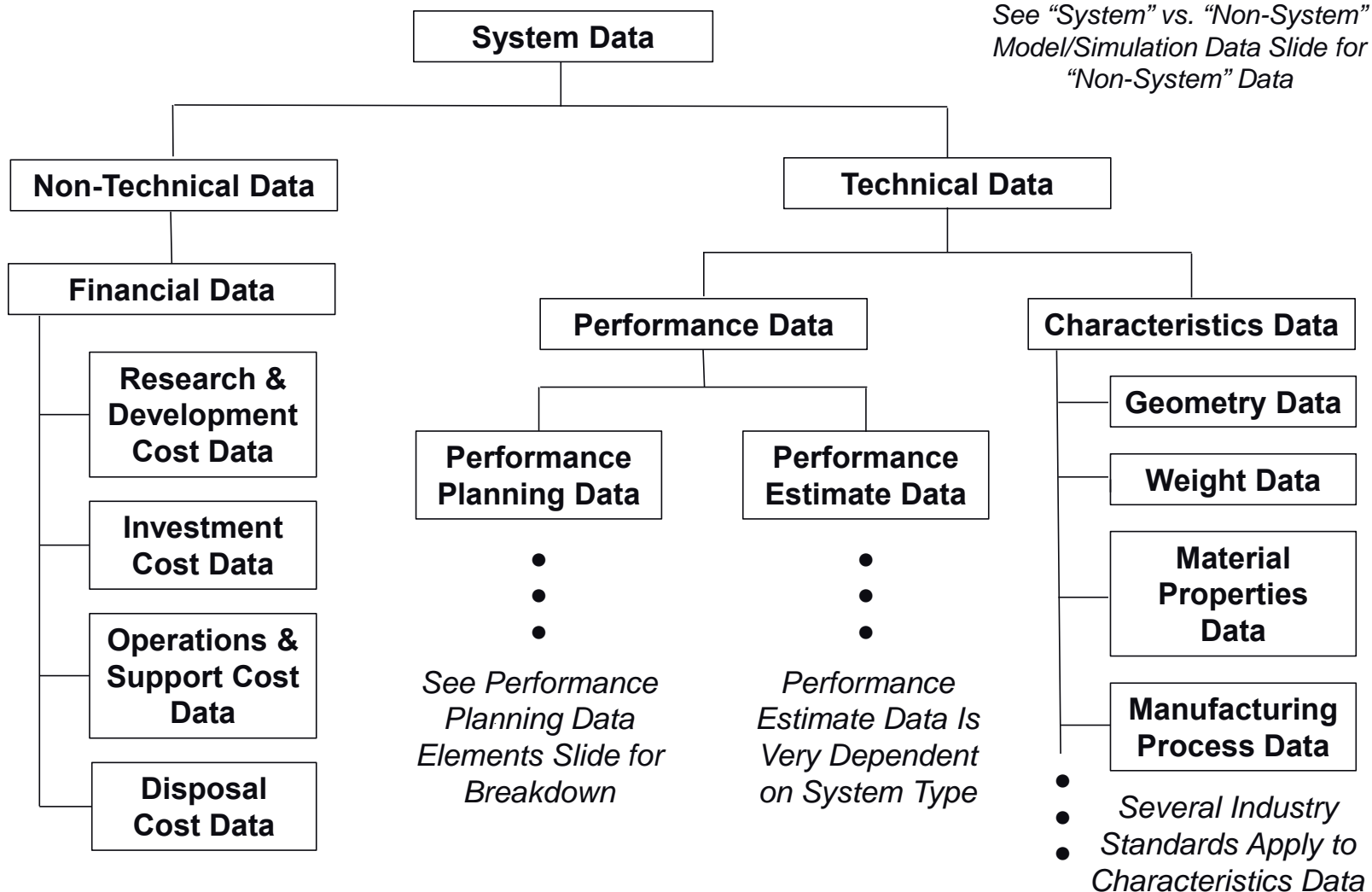
# System vs. “Non-System” Data



# Major Components of a Collaborative M&S Environment



# A Suggested Overarching Taxonomy for System Data



## Selected References

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- 1. MIL-STD-31000A, Department of Defense Standard Practice, Technical Data Packages, Department of Defense, Washington, DC (Feb 2013).**
- 2. ISO 10303, Automation systems and integration — Product data representation and exchange, International Organization for Standardization, Geneva, Switzerland (2013/prior).**
- 3. Defense Acquisition Guidebook, Department of Defense, Washington, DC (Sep 2013).**
- 4. Stirk, C. and Price, D., “Applications of the STEP AP 233 Systems Engineering Information Model,” NDIA Systems Engineering Modeling & Simulation Committee Meeting, Washington, DC (Jun 2009).**
- 5. GEIA-STD-927-A, Common Data Schema For Complex Systems, TechAmerica, Ann Arbor, MI (Jun 2010).**
- 6. GEIA-STD-0007-B, Logistics Product Data, TechAmerica, Ann Arbor, MI, (Jul 2013).**
- 7. SISO-STD-008-2010, Standard for: Core Manufacturing Simulation Data – UML Model, Simulation Interoperability Standards Organization, Orlando, FL (Sep 2010).**
- 8. Manual for the Operation of the Joint Capabilities Integration and Development System, Chairman of the Joint Chiefs of Staff, Department of Defense, Washington, DC (Jan 2012).**
- 9. Operating and Support Cost-Estimating Guide, Office of the Secretary of Defense (Cost Analysis Improvement Group), Department of Defense, Washington, DC (Oct 2007).**
- 10. Eirich, P. L., Purdy, E. M., and Coolahan, J. E., “A Collaborative Environment Architecture for Future Combat Systems (FCS) Modeling and Simulation,” in Proc., 2002 Spring Simulation Interoperability Workshop, Simulation Interoperability Standards Organization, Orlando, FL (Mar 2002).**
- 11. SEDRIS, <http://www.sedris.org>, SEDRIS Technologies (2013/prior).**