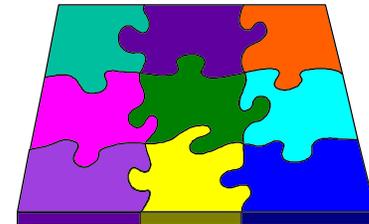


Bellcore

The Role of Testing in the Standards Life Cycle



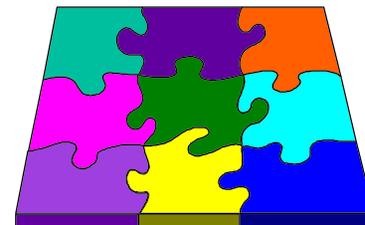
**NIST Workshop
on
Advancing Measurements
and Testing for
Information Technology**

**Art Reilly
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Role of Testing in the Standards Life Cycle

Topics

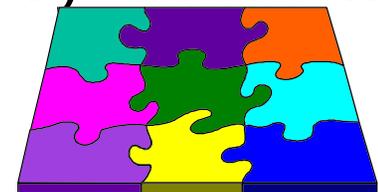
- Background
- The Standards Life Cycle
- Role and Impact of Testing
- Testing Challenges



Role of Testing in the Standards Life Cycle

Background

- 1970's - Standards begin to be more forward-looking and increasingly facilitate a multi-vendor environment
- 1980's - Conformance and Interoperability Testing become more important
- Late 1980's - Industry Forums, e.g. NIST-sponsored North American ISDN Users' Forum (NIUF), begin to be established
- Early 1990's - A Life Cycle model is needed to reflect the on-going relationships and responsibilities
- 1992 - The Americas' Telecommunications Standards Symposium (ATSS), hosted by Committee T1, established a Standards Life Cycle

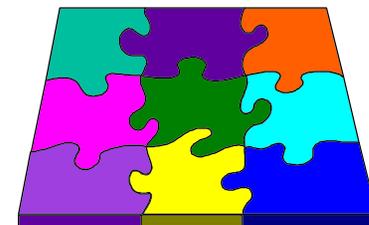


Role of Testing in the Standards Life Cycle

Decision Making based on Manager's Intuition

“It is very difficult to make a vigorous, plausible and job risking defense of an estimate ... derived by no quantitative method, supported by little data, and certified chiefly by the hunches of the managers.”

Frederick P. Brooks, Jr.
The Mythical Man-Month

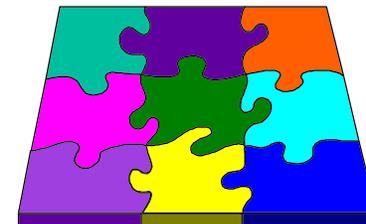


Role of Testing in the Standards Life Cycle

Performance 3X3 Matrix*

<u>Criteria</u> <u>Function</u>	Speed	Accuracy	Dependability
Access			
Information Transfer			
Disengagement			

* 3X3 Matrix - ITU-T Recommendation I.350



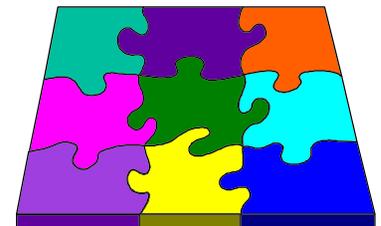
Role of Testing in the Standards Life Cycle

Types

- Supplier Analysis and Testing
 - ⊗ Modules
 - ⊗ Products
 - ⊗ Interoperability

- User or Independent Third Party Analysis and Testing
 - ⊗ Modules
 - ⊗ Products
 - ⊗ Interoperability

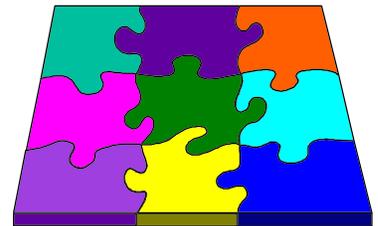
- Industry-sponsored Analysis and Testing
 - ⊗ Interoperability



Role of Testing in the Standards Life Cycle

Benefits

- Provide Objective Assessment of Features, Functions, and Capabilities
- Assess Conformance and/or Acceptability
- Establish Benchmarks
- Identify Defects
- Determine Failure Modes in Stress testing
- Establish Interoperability of Multi-vendor Systems
- Identify Areas for Improvement



Role of Testing in the Standards Life Cycle

Challenges

- Efficient Testing

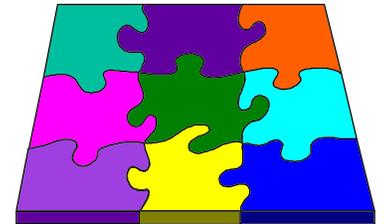
- ⊗ Reduce the number of test cases and improve quality
 - ⊗ Test Requirements
 - ⊗ Constraints
 - ⊗ Experience on nature and frequency of field failures
 - ⊗ Combinatorial design
- ⊗ Automation of testing and results analysis

- Client Server Testing

- Testing of Flows

- Automation of the Test Development Process using natural language

- Configuration-design Expert Systems to guide users to improve field performance based on field test results





**The reasonable man adapts himself to the world;
the unreasonable man persists in trying to adapt
the world to himself.**

**Therefore, all progress depends on the
unreasonable man."**

-- George Bernard Shaw