



# Standards for **Business**

## **ETSI White Paper No. 3 Achieving Technical Interoperability - the ETSI Approach**

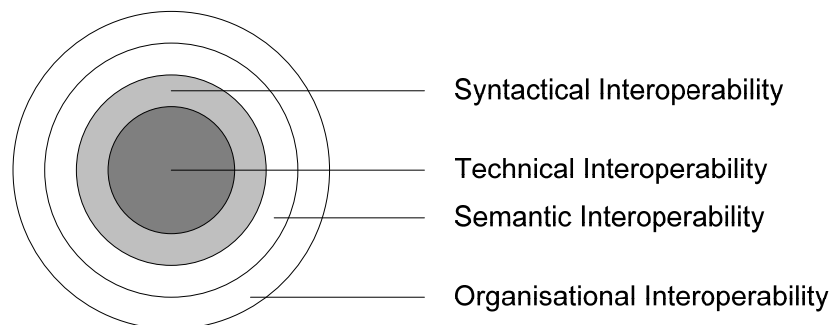
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**October 2006**

**Standards for Business**

# Different 'levels' of Interoperability

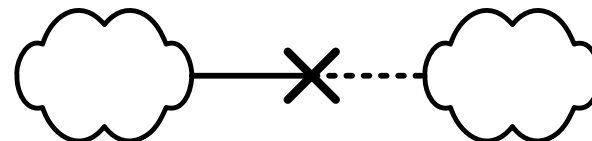
- Technical
- Syntactic
- Semantic
- Organisational



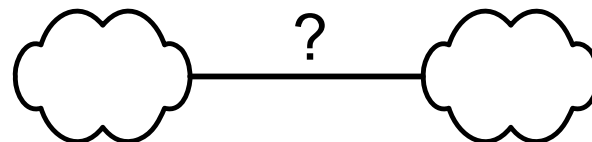
- "*Interoperability is the ability of two systems to interoperate using the same communication protocol*" from ETSI Project TIPHON (now closed).
- Or in the context of 3GPP
  - "*the ability of two or more systems or components to exchange data and use information*"

# Typical symptoms of non-interoperability

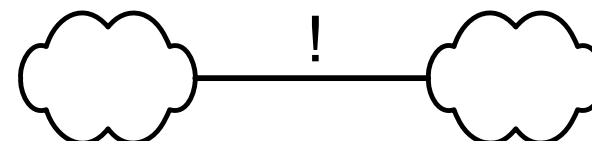
- ❑ Where are you?



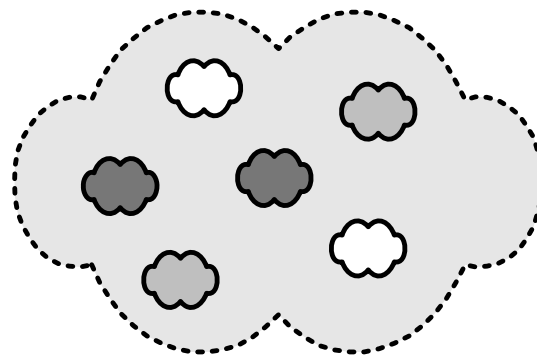
- ❑ What did you say?



- ❑ Why did you do that?



# Interoperability and complex systems



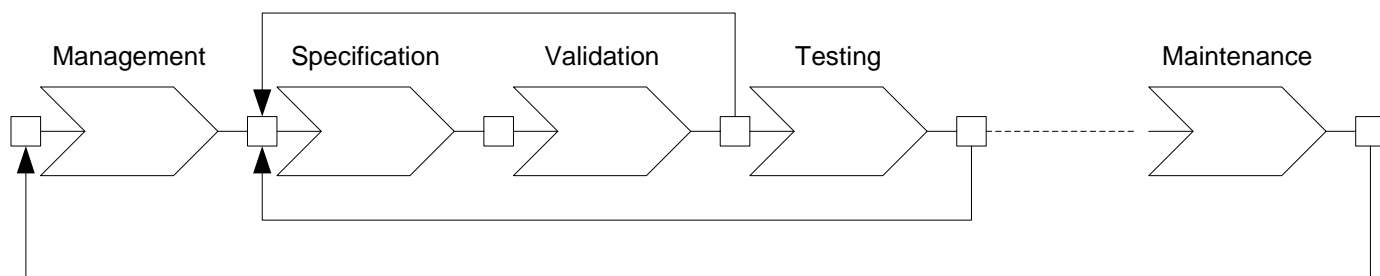
- ❑ ICT standards increasingly specified by islands of standards
- ❑ Multiple sources of standards for 1 system
  - e.g. NGN, IMS
- ❑ Multiple specifications for 1 protocol
  - e.g. SIP

## Root causes of standards failing to provide interoperability

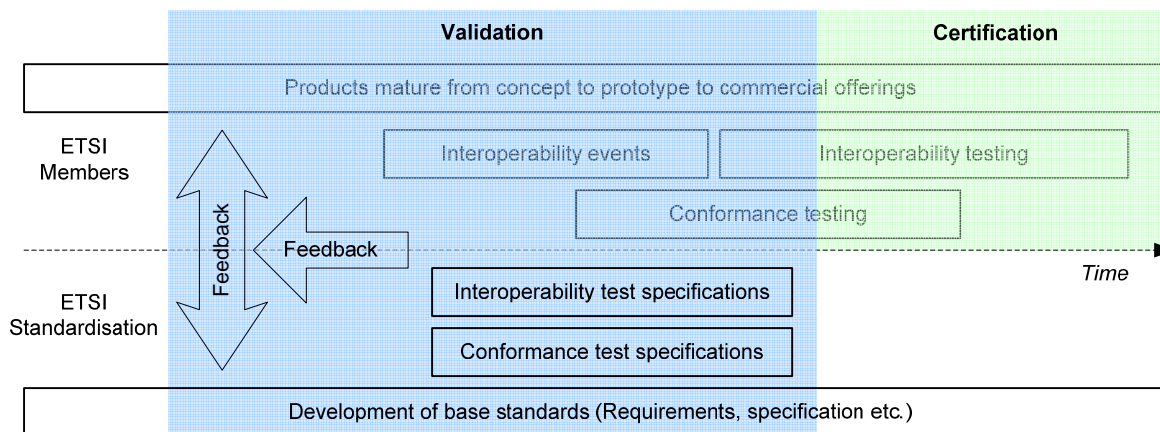
- Incompleteness
- Inadequately defined interfaces (reference points)
- Poor handling of options – too many, poorly specified
- Lack of clarity
- Poor maintenance
- Lack of system overview
- Using standards beyond their original purpose
- Varying quality of standards in 1 system

# Building interoperability into ETSI standards

- ❑ Manage for interoperability!
- ❑ Specify for interoperability!
- ❑ Validate for interoperability!
- ❑ Test for interoperability!
- ❑ Maintain for interoperability!

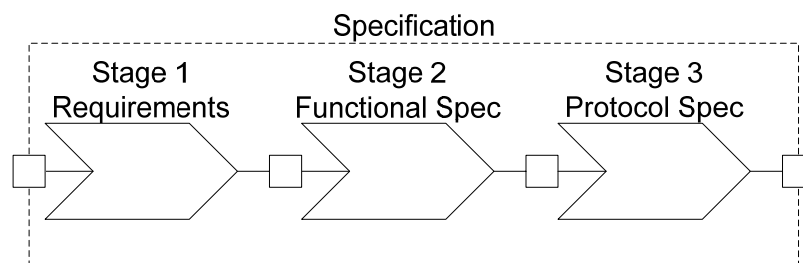


# Manage for interoperability!



- ❑ Good project management and overview
- ❑ Important in any standardisation project
- ❑ Essential in a multi-organisation, multi-specification standards project
  
- ❑ ETSI has teams of dedicated Technical Officers to support ETSI TBs, and provide project management

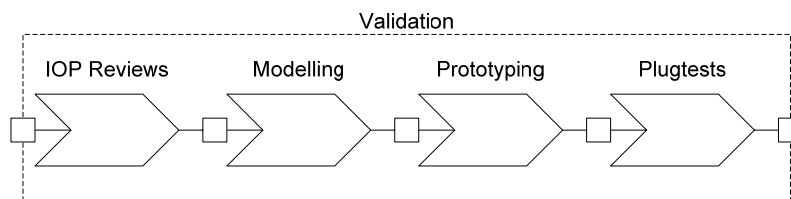
# Specify for interoperability!



- ❑ ITU-T I.130 3-stage model for protocol specification
  - Used extensively in 3GPP
- ❑ Requirements
- ❑ Functional architecture and Information Flows
  - Standardise interoperable interfaces, not internal behaviour
- ❑ Detailed protocol specification
  - Use most relevant techniques: text, UML, SDL, ASN.1, XML etc.

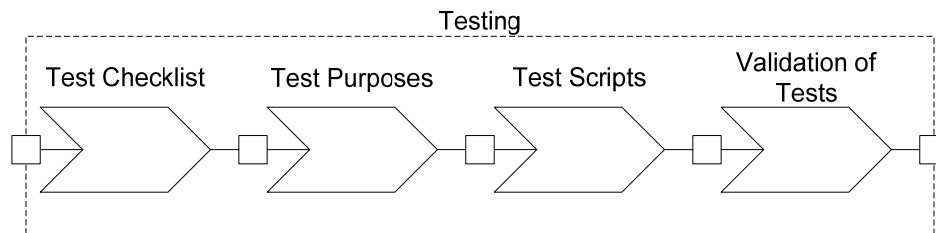


# Validate for interoperability!



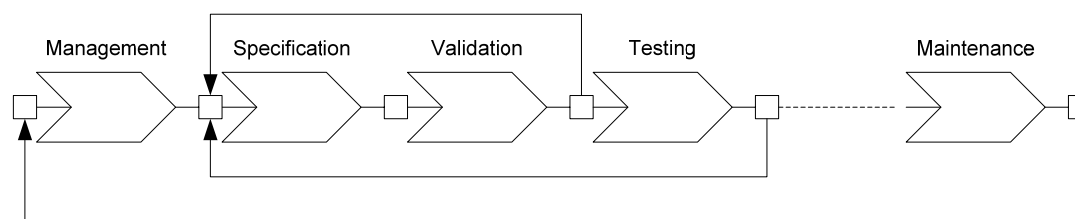
- ❑ Validation through technical reviews and simulation
- ❑ Validation through interoperability events
- ❑ Validation through test specification development

# Test for interoperability!



- ❑ Plan for validation and Plan for testing!
- ❑ Conformance Testing and Interoperability Testing
- ❑ Use existing methodologies
  - ISO/IEC 9646, TTCN-3, ETSI Interoperability Testing Methodology
- ❑ Validate test specifications

# Maintain for interoperability!



- ❑ Good standards can be broken by poor maintenance
  - Or no maintenance!
- ❑ Corrections to be made with care
- ❑ Extensions require same process as original development
- ❑ Feedback needs to be sought and captured

# Conformance Testing and Interoperability Testing are Complementary

- ❑ **ETSI experience**
  - As you move up a system stack the emphasis should change from conformance to IOT
  - Moving from component testing, to more complex interoperability issues
  
- ❑ **Lower layer protocols, infrastructure**
  - Emphasis on conformance
- ❑ **Middleware, enablers**
  - Combination of Conformance + IOT
- ❑ **Services, applications, systems**
  - Emphasis on IOT
  
- ❑ **Conformance testing as a pre-requisite to IOT**
  - Ensure interoperability through standardised interfaces
- ❑ **Interoperability testing with conformance verification**
  - E.g. end-to-end conformance tests with intermediate reference point verification

# Specific ETSI initiatives and support for interoperability

- ❑ **ETSI Board Champion for Interoperability**
  - Co-ordination for interoperability issues
- ❑ **ETSI interoperability workshops**
  - Open to members and non-members of ETSI
- ❑ **ETSI Technical Committee MTS**
  - Methods for Testing and Specification
  - Provides frameworks and methodologies to ETSI TBs
  - Making Better Standards: <http://portal.etsi.org/mbs>
- ❑ **ETSI Protocol and Testing Competence Centre**
  - Practical help for ETSI TBs to use latest tools and techniques for specification, validation and testing
- ❑ **ETSI Plugtests service**
  - Organises and runs interop test events
  - Open to members and non-members of ETSI
  - For technologies inside and outside of ETSI

# Conclusions

- ❑ ETSI places great importance on producing interoperable standards
  - Extensive process and support
- ❑ New dangers for interoperability, with new standards projects
  - Technical complexity
  - Partial specifications
  - Many organisations involved
- ❑ ETSI continues to seek ways to improve interoperability
  - Process improvements
  - New resources
  - New techniques
  - Not forgetting what has been proven to work!



# Thank you!

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Whitepaper can be downloaded from

[http://www.etsi.org/etsi\\_radar/whitepaper/home.htm](http://www.etsi.org/etsi_radar/whitepaper/home.htm)