Standards of quality and quality of standards for Telecommunications and Information Technologies (ICTs)

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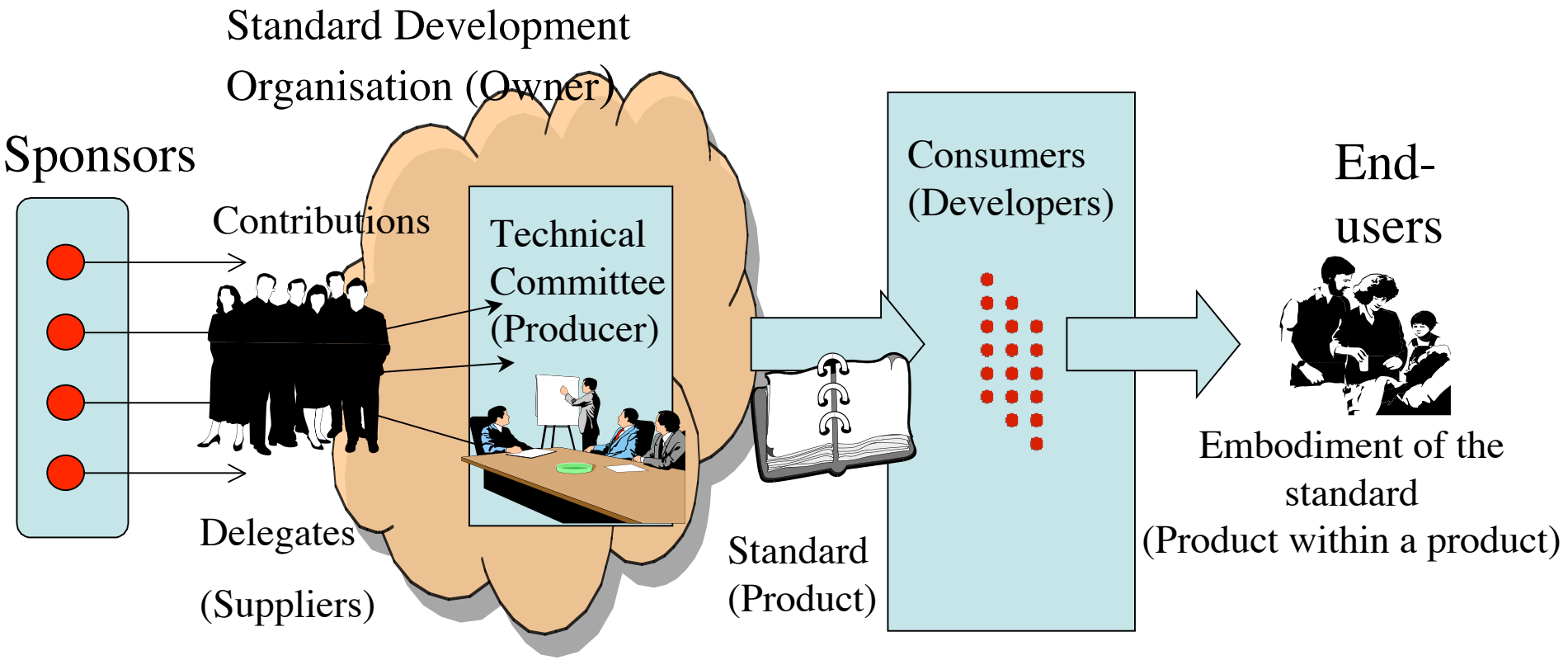
Central Thesis

- Standards development is a project
- Quality of standardization can be evaluated using project management methodology
- Stakeholders have different interests and time scales
- Current standardization process does not encourage quality management
- Risk management is done on a case-by-casel basis

Outline

- How to define quality of standards?
- Standards and TQM
- Standards as projects
- Risk indicators using project methodology
- Conclusions and Perspectives

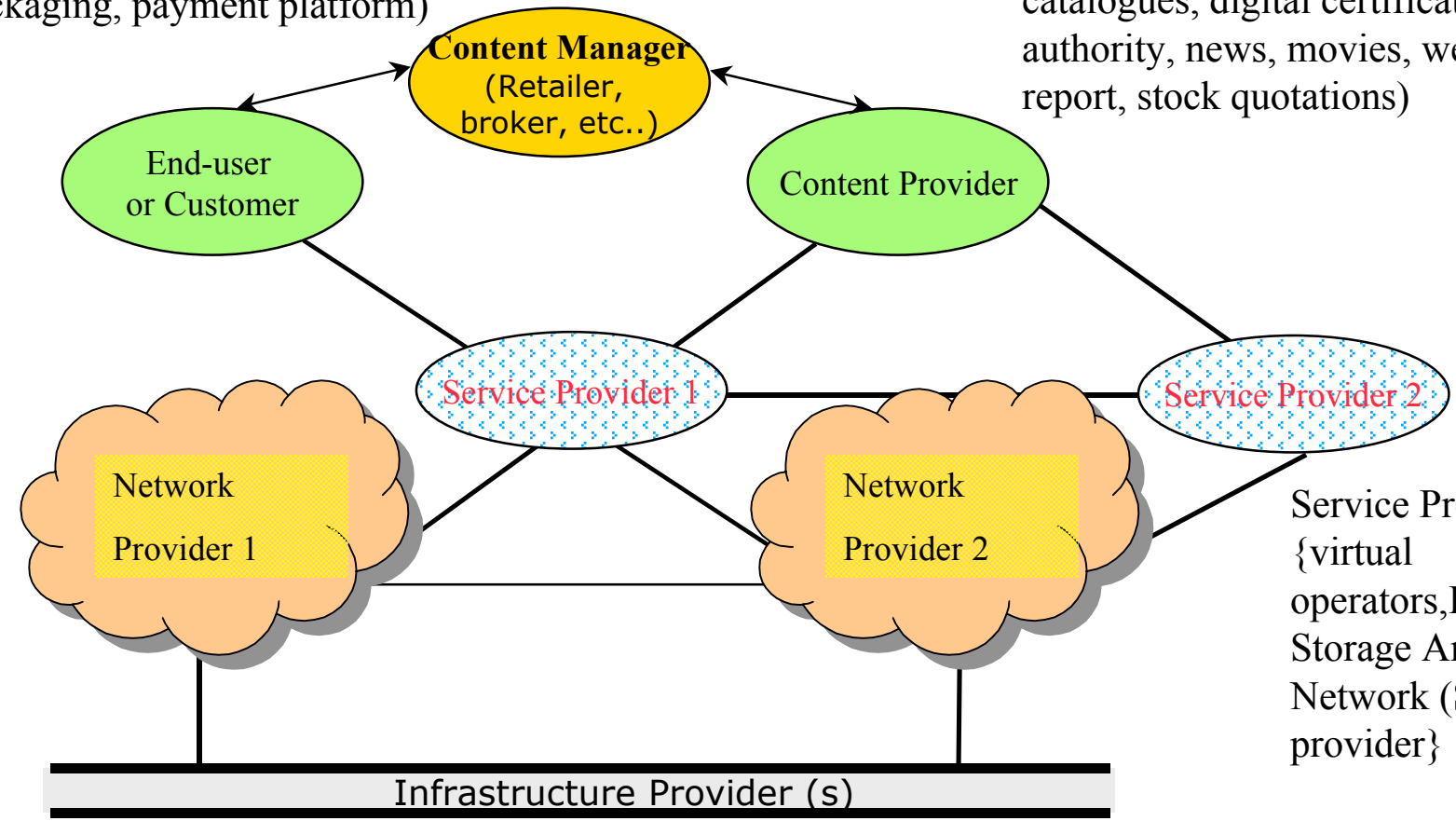
Stakeholders



Interfaces to be Standardized in ICT

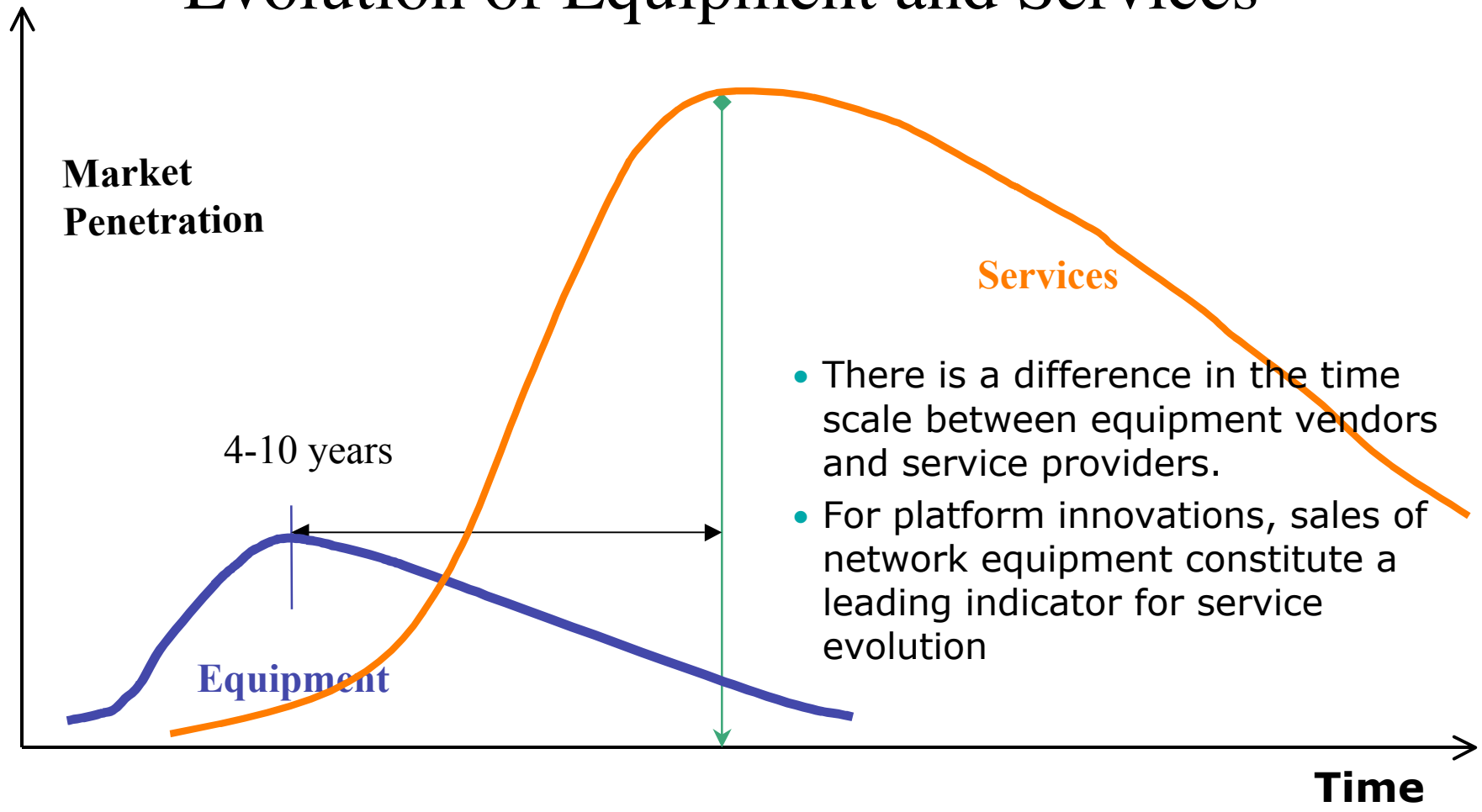
Content Manager (Customer Relationship Manager, content packaging, payment platform)

Content Provider (Call center, catalogues, digital certification authority, news, movies, weather report, stock quotations)



Service Provider {virtual operators,ISP, Storage Area Network (SAN) provider}

Evolution of Equipment and Services



- There is a difference in the time scale between equipment vendors and service providers.
- For platform innovations, sales of network equipment constitute a leading indicator for service evolution

Standardization for ICT Services

- Internal standards
  - increase operational efficiency
  - improve response to emergencies
- External standards
  - Reduce uncertainties concerning equipment compatibility
  - Establish framework for negotiation with other carriers and virtual operators
  - Ensure continuity of supply
  - Avoid monopoly of a single source
  - Reduce dependence on technical expertise
  - Standards for performance and quality
  - Communication of OSSs

Cost of Deficient Standards

- Link State protocols
  - Loss of topology databases
  - Congestion of routing updates
- MPLS and LDP
  - No methods for operations, administration and maintenance of the network
  - No methods for fault localization
  - No mechanism for end-to-end trouble shooting

Highlights of the ICT Standardization Process

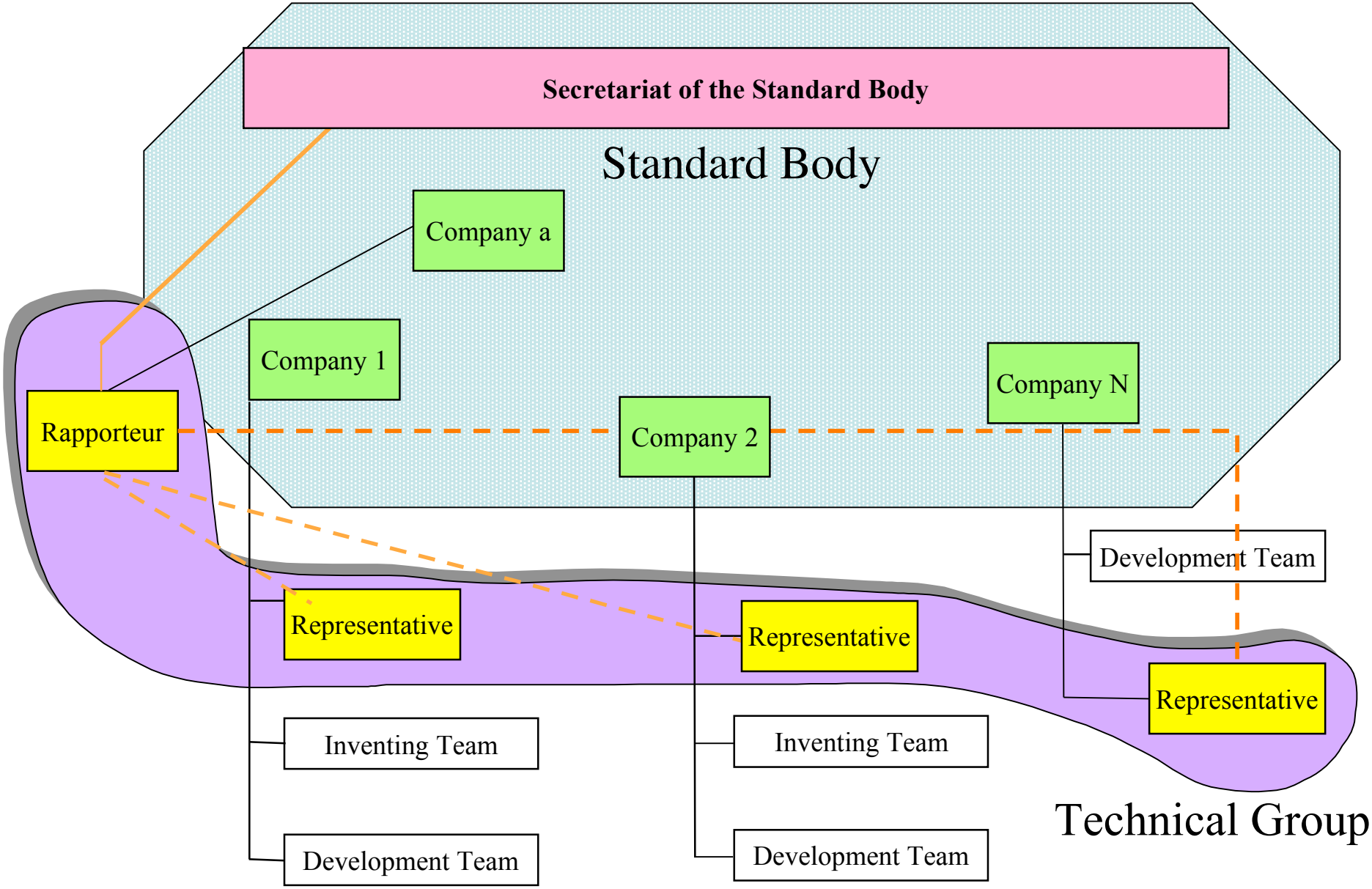
- Multiple interfaces
- Time scale of interest is different
  - It takes 3-4 years on average (range 1 -10 years) for an external standard to be developed and successfully implemented in commercial products
- Standardization is part of the process of knowledge management
  - Various approaches to standardization
    - Follow the dominant trend
    - Passive participation
    - Technical contribution
    - Influence market expectations
    - Start a new consortium
- None of the stakeholders have direct control over the standardization process
- Difference in perspective between each stakeholder

Standards and TQM

- Crosby (1979): conformance to requirements
  - In standards, the commercial and strategic goals of the participants are not part of the standard
- Deming (1986): uniformity and predictability
  - Standards are unique
- Juran (1992): Fitness for use - ISO 9000
  - User's requirements are not available

Standards as Projects

- Rapporteur or convener is the project manager
- Weak control
- What is a successful project?
  - Meet the project requirements?
  - Financial success of the project output?
- "Successful" standards are widely implemented but
  - Deficiencies in the standards affect the quality, reliability and cost of the product or service
  - Quality of the standardization process does not address the quality of products or service and their financial success


Secretariat of the Standard Body
Standard Body
Company a
Company 1
Company N
Company 2
Rapporteur
Development Team
Representative
Representative
Representative
Inventing Team
Inventing Team
Development Team
Development Team
Technical Group

Project Management Methodology

- Scope management
- Time Management
- Quality Management
- Cost Management
- Resource Management
- Documentation Management

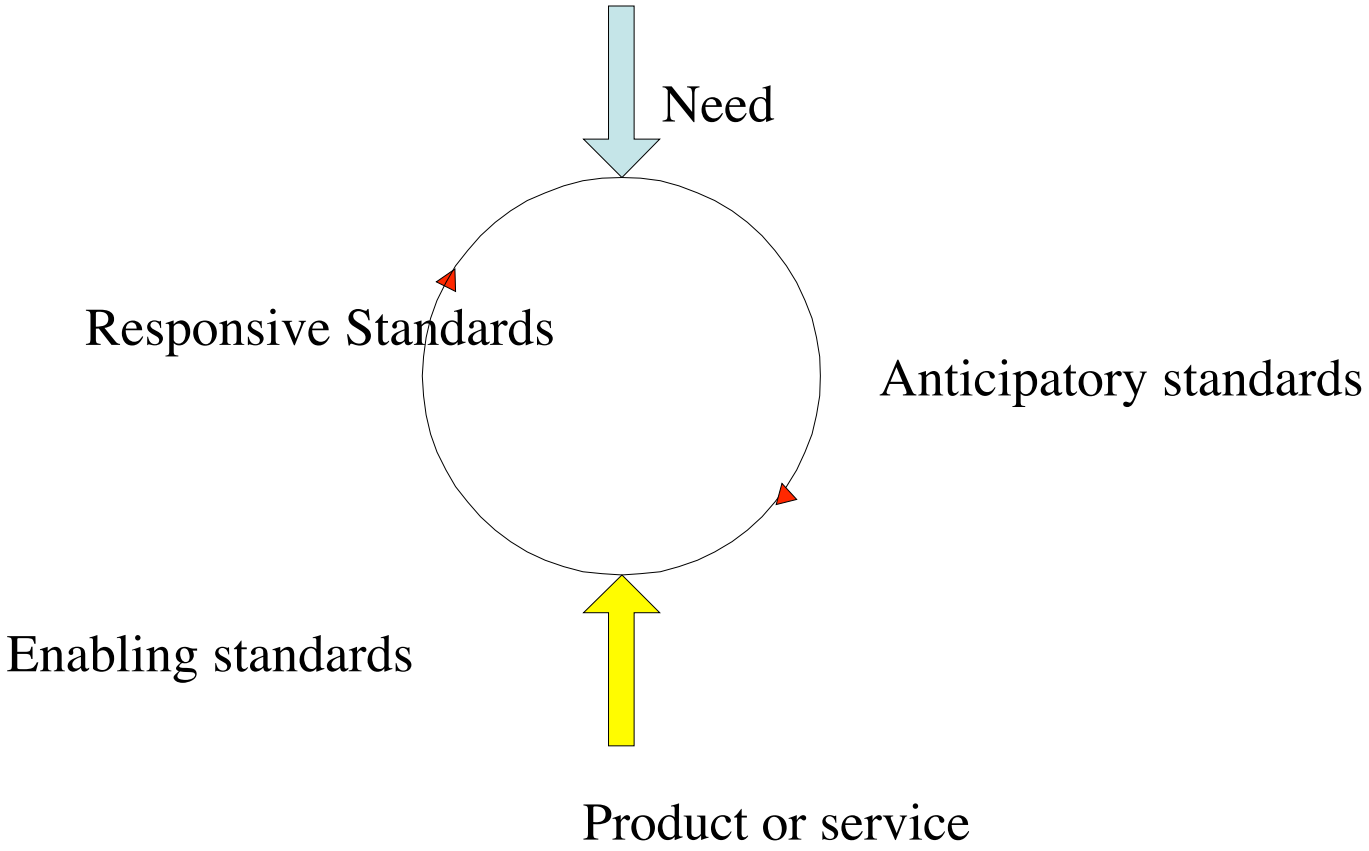
Indicators that Scope is not well managed

- No or superficial terms of reference
- Scope is not consistent with the lifecycle of the technology
- Too many options for emerging technologies
- Changes in the terms of reference without considering impact on schedule
- No formal process to re-evaluate the need for the standard of change
- Existing of other standard groups with similar or overlapping activities
- Frustrated stakeholders leave and form their own group

Time Management

- ICT Stakeholders have different time horizons
- Service vs. Equipment
- Marketing vs. Technical
- Speed of standardization should be commensurate with the goals
- Speed of standardization depends on the type of standardization body

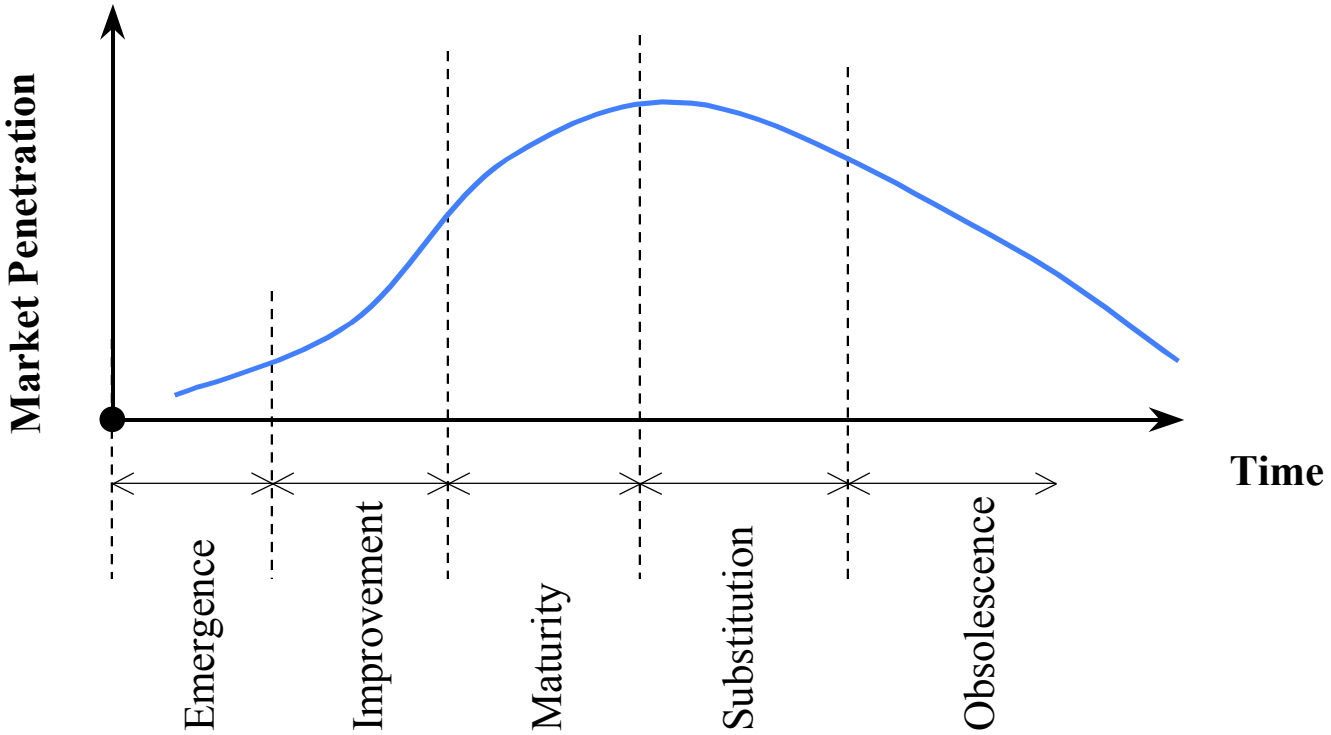
Marketing Aspect of Standardization



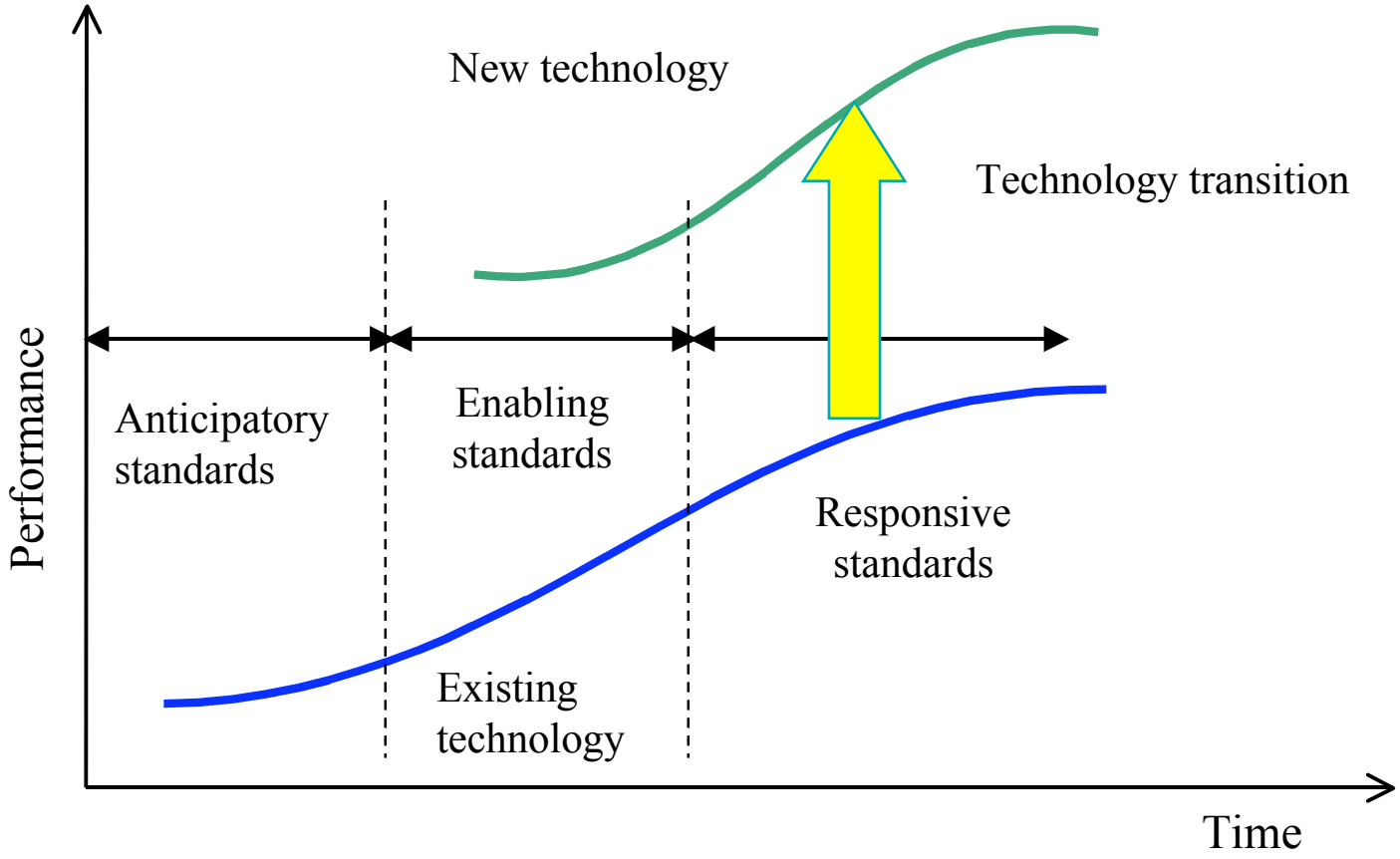
Examples

- Anticipatory standards
  - ISDN, WAP or GSM (partly), X.25, TCP/IP, UMTS, G3 and G4 facsimile, etc.
- Enabling (participatory) standards
  - GSM
- Responsive standards
  - GPRS, SMS (for service providers, but anticipatory for equipment manufacturers)
  - HDLC
- Architectural innovations tend to avoid standards (minitel, i-mode, smart cards, etc.). Exceptions: Bluetooth and WAP

The Technological Dimension:
Technology Life Cycle



Technology View of Standardization Timing



Quality Management

- Internal consistency
- Formal description vs. human language description
- Reviews (walk-throughs)
- Automatic verification
- Conformance testing and reference implementation
- Interoperability Testing
- Translation to other languages

Cost Management

- Principle: benefits of development should exceed the cost
- Application is difficult
- Direct costs (travel, salaries, etc.)
- Indirect costs (revealing proprietary information, royalties, etc.)
- Cost of deficient standards
- Costs of incompatibilities, of conformance and interoperability testing, etc.

Difficulties of Cost Management

- Historical data are not available
- Standard development is a shared exercise and the expenditure is not centralized
- Collecting real cost data is expensive
- Alternatively, tracking the effort in terms of man-hours may be a first step (the objective is not to meet some accounting standards or regulation but to provide a project planning and decision tool)

Resource Management

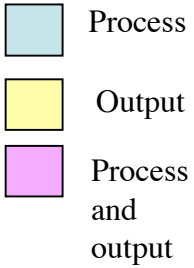
- Resources are borrowed and not dedicated full-time
- Signs of trouble
  - Some participants take over
  - Competing interests lead to a deadlock
  - Group think and rejection of new ideas
- Decision criteria including escalation procedures should be defined in the scope

Documentation Management

- More than just a basic form and style for the published documents
- Must be readable by outsiders
- Contributions that justify the final text should be available
- Web-centered document maintenance may offer some remedies

Stakeholders Interest in Standards Quality

Stakeholders	**Area of Interest**	**PM Aspect**
Standards Body	Legitimacy, due process	Resource
Technical Committee	Technology, due process	Quality of specs, resource, time
Companies	Financial, marketing, technology	Resource, quality, cost, time
Implementors	Technology	Quality of specs and documentation
End-Users	Technology	Quality of the implementation
Regulators	Legitimacy due process	Quality of specifications, documentation



Can the standardization process be improved?

- Standardization process is distributed
- There is a time lag between a standard and its embodiment in a product or a service
- There is no clear profit/loss responsibility
- Cost of deficiencies in standards are deflected to other parties than those that have defined the constraints of scope, cost and time
- Market mechanisms do not offer incentives to improve the standard process

Conclusions and Perspectives

- Project management provides a check list of potential troublesome signs in the standardization process
- This list can be used for risk identification and management at an individual level (rapporteur, standard body or participant company)
- There is a need for wide scale education to encourage all stakeholders to use this list of risk management at their levels.