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Managing e-Infrastructures

Requirements, frameworks and future challenges

Open e-IRG Workshop
Uppsala, Sweden
14-15 October 2009

Goals of this presentation

Explain the main objectives and key concepts in **"traditional" IT Service Management**

Give a brief **overview of management frameworks** and standards for **process-oriented** infrastructure management

Outline **what can be learned** from these frameworks for **managing e-Infrastructures**

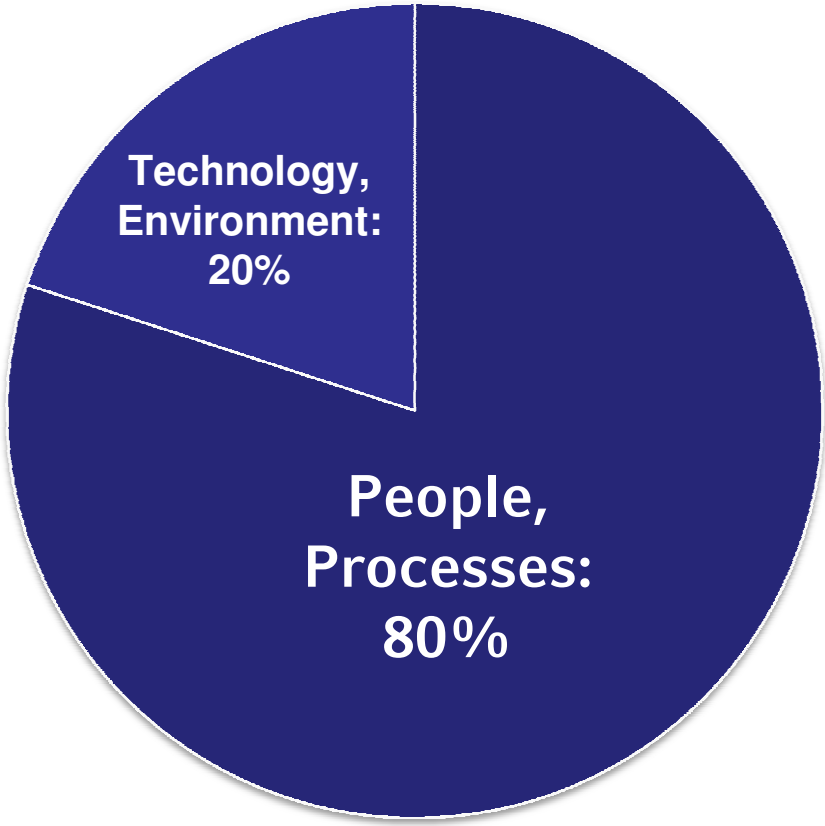
Exemplary **highlight the Service Delivery Problem in grids** as one important, but unsolved issue in managing e-Infrastructures

Conclude with the **major critical fields of challenges** in managing e-Infrastructures

Agenda

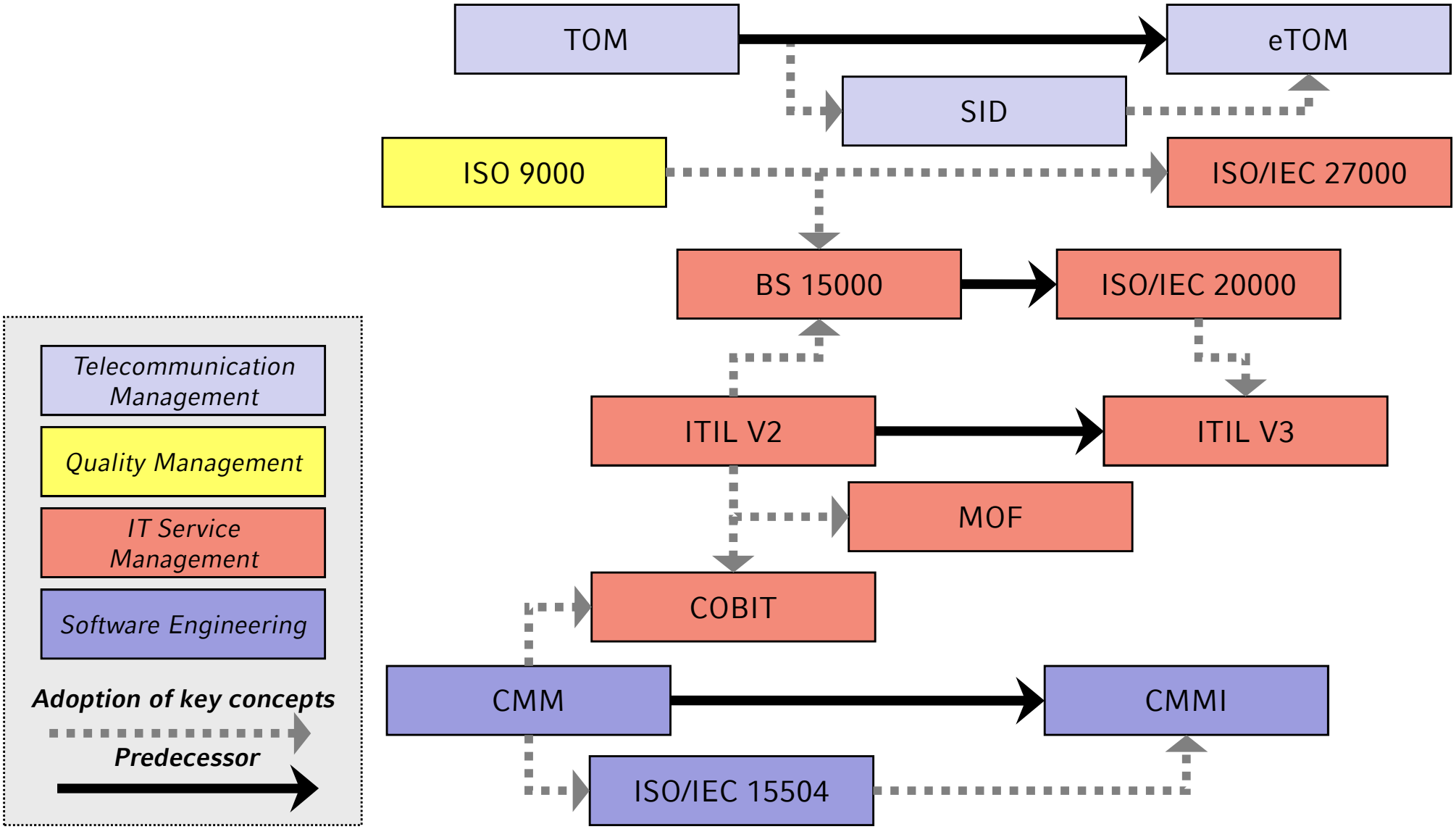
1. IT Service Management Foundations
   - Motivation and objectives
2. Important Standards and Frameworks for (traditional) Infrastructure Management
   - IT Infrastructure Library (ITIL)
   - Microsoft Operations Framework (MOF)
   - ISO/IEC 20000
   - Enhanced Telecom Operations Map (eTOM)
3. Managing e-Infrastructures
   - "Traditional" infrastructures vs. e-Infrastructures
   - Resulting challenges → the Service Delivery Problem
   - Hypotheses and critical management challenges
   - Taking benefit from existing frameworks

- Why IT Service Management?
  - About 80% of all service outages originate from "people and process issues"
  - Duration of outages and degradations significantly dependent on non-technical factors
- IT Service Management …
  - … aims at providing high quality IT services meeting customers' and users' expectations …
  - … by defining and installing **management processes** covering all aspects of managing the service lifecycle:
    - Planning
    - Roll-out and delivery
    - Operational support
    - Changing and improving



Sources of service outages [Gartner, 2001]

2. Important Management Standards and Frameworks



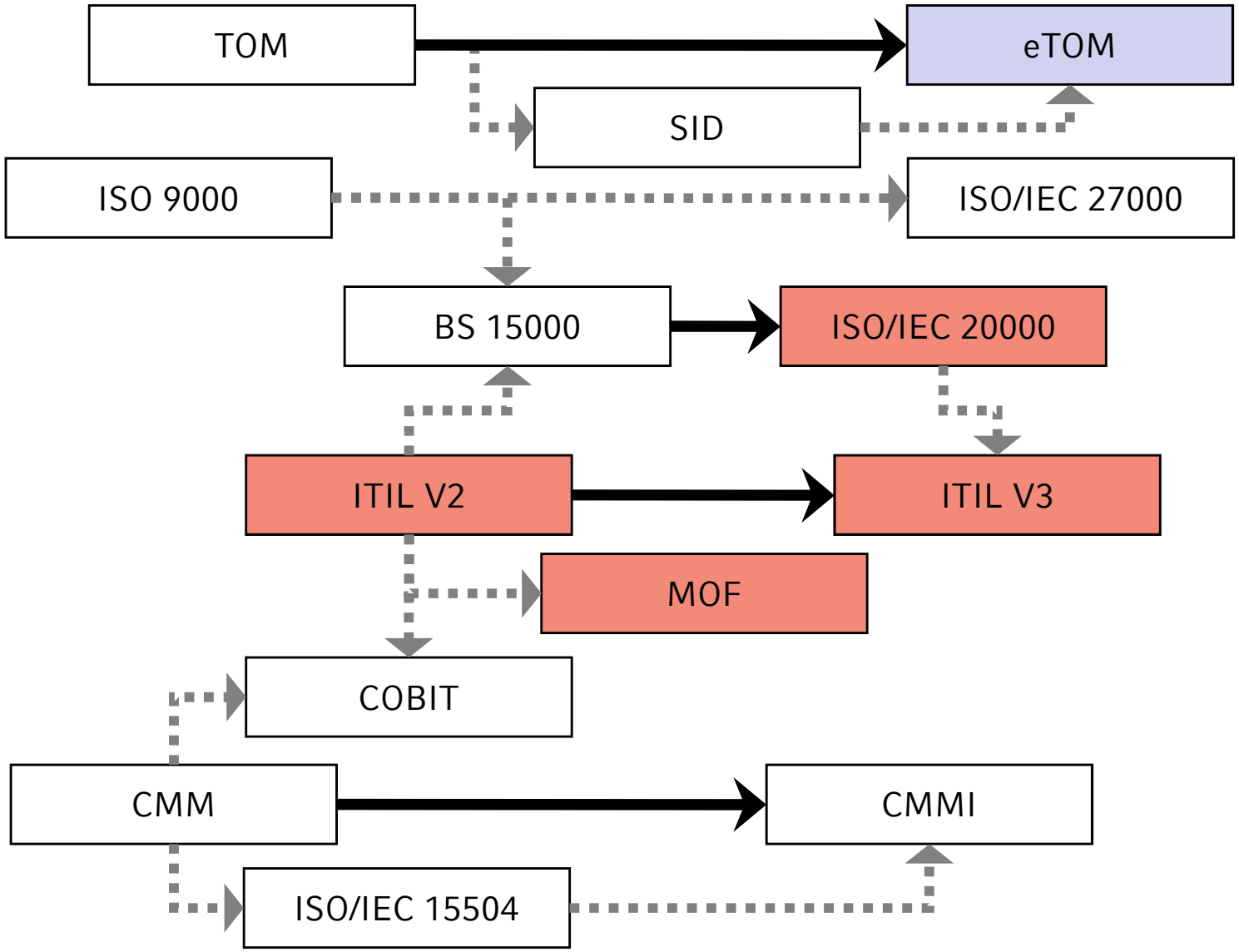
2. Important Management Standards and Frameworks

ITIL

MOF

ISO/IEC 20000

eTOM

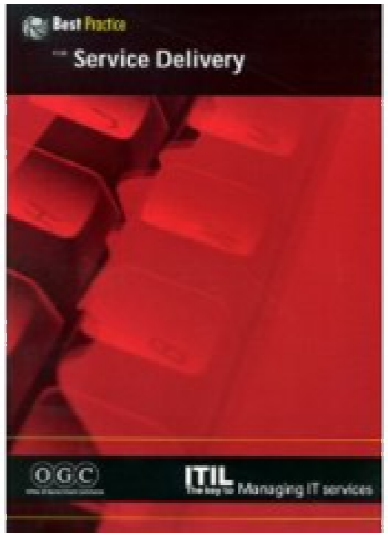


What is ITIL?

- Collection of documents/books containing "Good Practice" for IT Service Management / managing infrastructures
- Slogan: "the key to managing IT services"
- Descriptions of management processes and supporting concepts
- Not an official standard, but often referenced as the de-facto standard for IT Service Management
- Publication medium: books
- Versions
  - 1989: ITIL Version 1
  - 2001: ITIL Version 2 (ITIL V2)
  - 2007: ITIL Version 3 (ITIL V3)

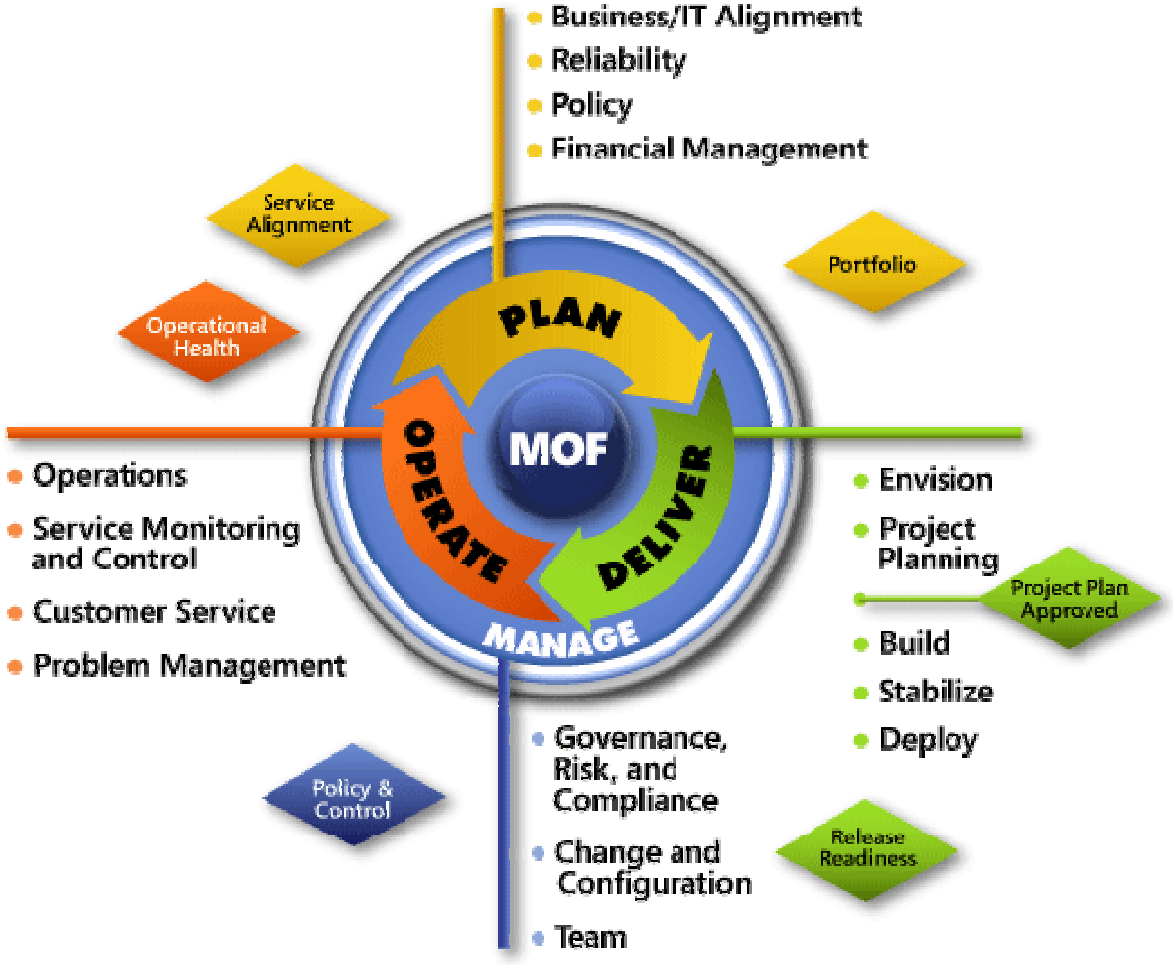
IT Infrastructure Library (ITIL)
Management processes and goals (excerpt)

Incident Management	Resolve incidents, restore service as fast as possible
Problem Management	Analyze incidents' root causes, improve infrastructure stability
Configuration Management	Documentation of the infrastructure configuration, development of a configuration management database (CMDB)
Change Management	Controlled authorization, planning and implementation of changes
Release Management	Packaging, testing and rollout of software and hardware releases
Service Level Management	Close Service Level Agreements (SLAs) with customers, monitor service level targets
Financial Management	Financial control of IT resources
Capacity Management	Define capacity requirements, plan and monitor capacities
Continuity Management	Contingency planning and disaster service recovery
Availability Management	Define availability requirements, plan and monitor availability



What is MOF?

- Operational guidance for IT Service Management
- Descriptions of management processes based on a simple service lifecycle
- Claims: Disposable, comprehensible, precise, instantly applicable, adaptable, technology-independent, compatible with other frameworks (in particular ITIL, COBIT, ISO/IEC 20000)
- Publication medium: electronic documents (available from the Internet)
- Current version: MOF 4.0



What is ISO/IEC 20000?

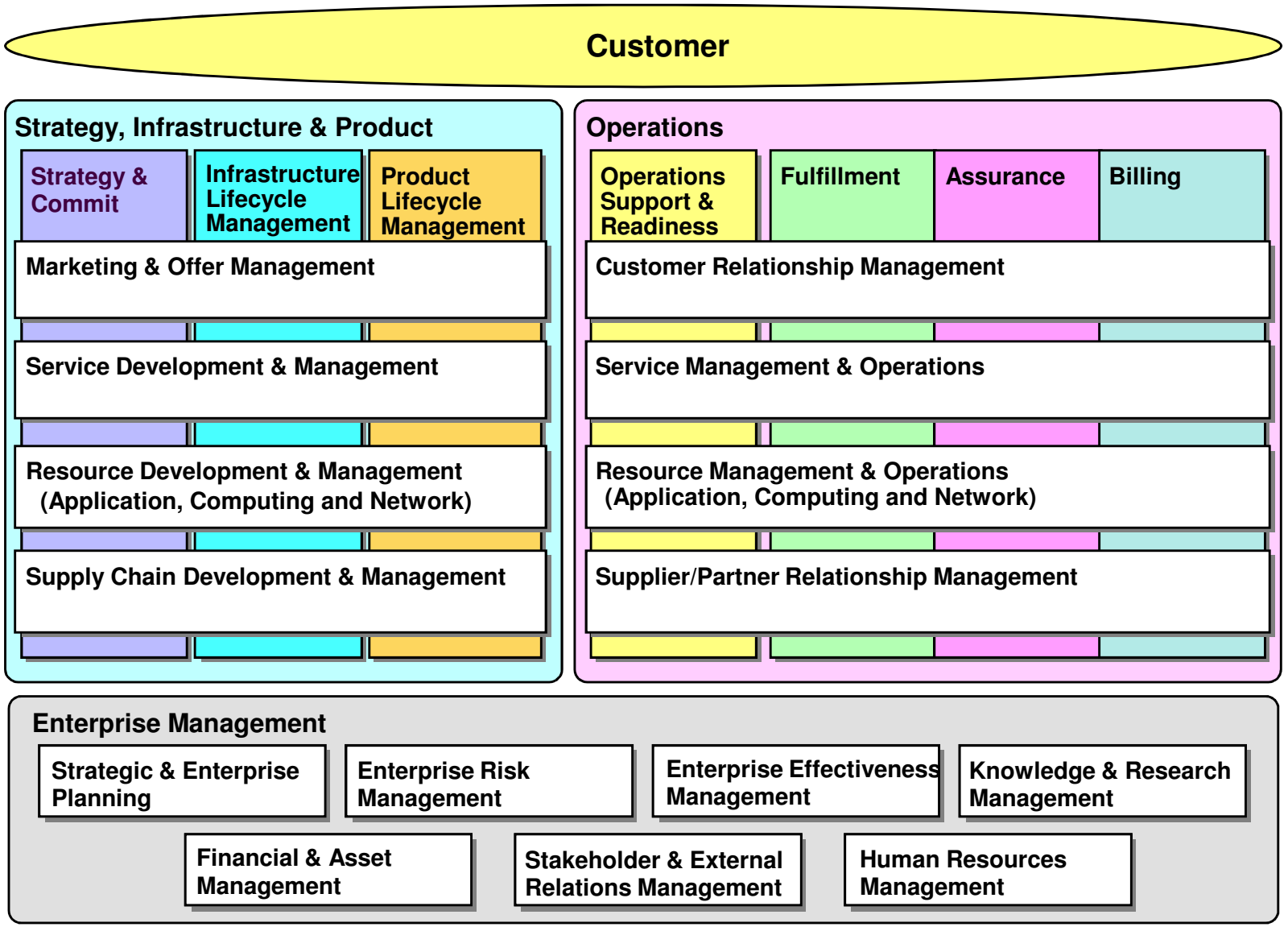
- An international standard, facilitating a process approach for the delivery of IT services
- A set of minimum requirements, used to assess an organization's IT Service Management with respect to its effectiveness
- Owner von ISO/IEC 20000:
  - ISO (International Organization for Standardization)
  - IEC (International Electrotechnical Commission)
- Publication medium: Print, PDF
- Current version: ISO/IEC 20000:2005, First edition (December 2005)


INTERNATIONAL STANDARD
ISO/IEC 20000-1
First edition 2005-12-15
Information technology — Service management —
Part 1:
Specification
Technologies de l'information — Gestion de services —
Partie 1: Spécifications
Reference number ISO/IEC 20000-1:2005(E)
© ISO/IEC 2005

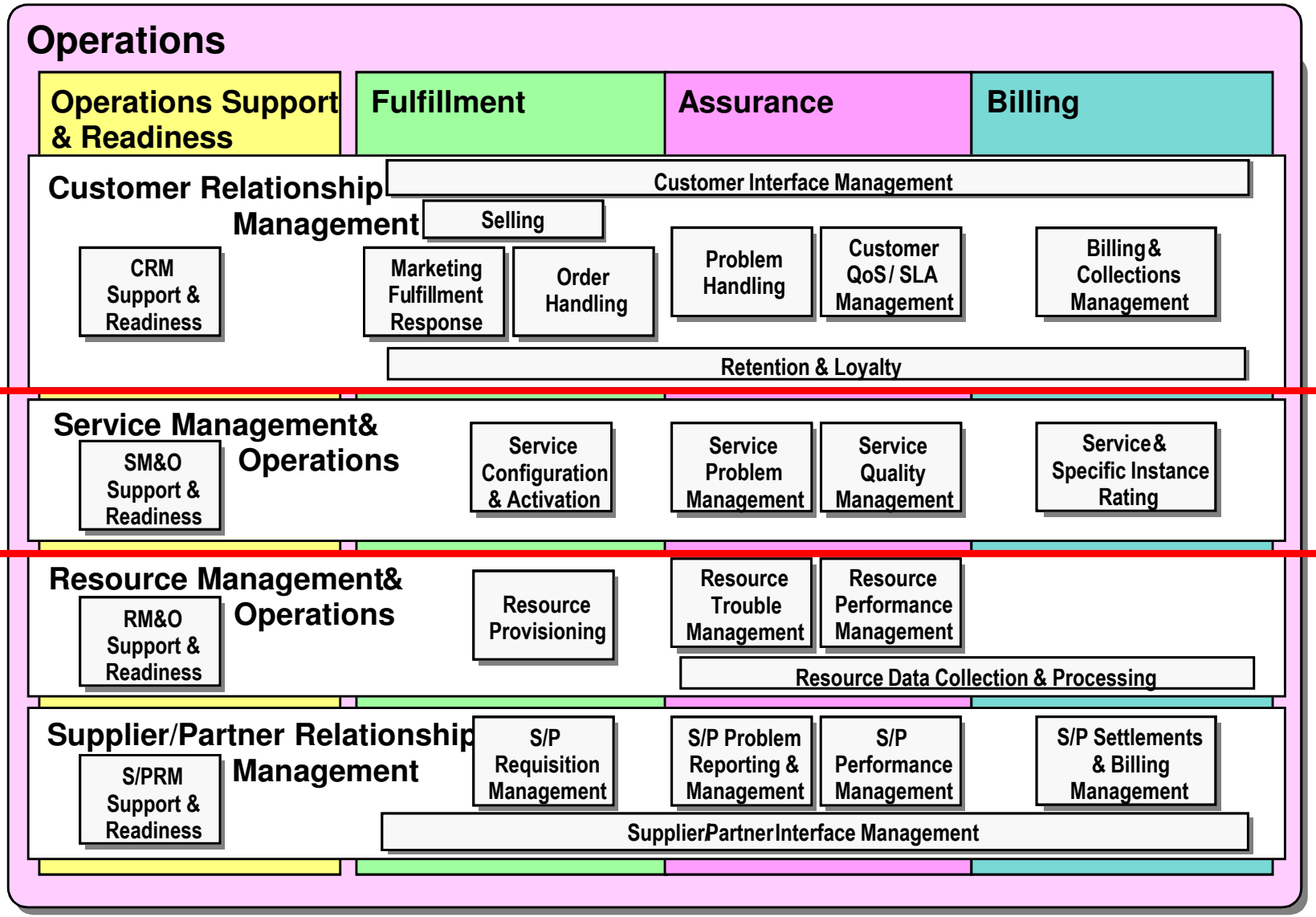
What is eTOM?

- Process framework for the management of telecommunication providers
- Slogan: “The Business Process Framework for enterprise management”
- Descriptions of management processes (comparable to ITIL), but not limited to IT-specific processes
- Multi-dimensional structuring and classification scheme; focus: 7-stage value chain
- Highly relevant in the telecommunication industry
- Publication medium: electronic documents (PDF, website/clickable eTOM)
- Current version: eTOM Solution Suite 8.0

Enhanced Telecom Operations Map
eTOM Framework Level 1



Enhanced Telecom Operations Map
eTOM Framework Level 2: Operations



Key objectives of all infrastructure management approaches:

- Process approach, quality management and customer/business-orientation
- Service-oriented, management of the entire IT service lifecycle
- Clear interfaces for control flows and information flows
- Consistent management information model/framework
- Automation of management procedures and control operations
- Service delivery underpinned by SLAs between provider and customers
- Continual improvement of service delivery and service management

→ What can we learn from ITIL, MOF, ISO/IEC 20000 and eTOM for the **management of e-Infrastructures**?

- Adoption of key concepts?
- Adaptations necessary?
- Example: Adoption of the SLA concept for grid environments

What is an SLA?

Written agreement between a service provider and a customer that documents services and agreed service levels.

Core definition [ISO/IEC 20000-1:2005]

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- Continual improvement of service delivery and service management

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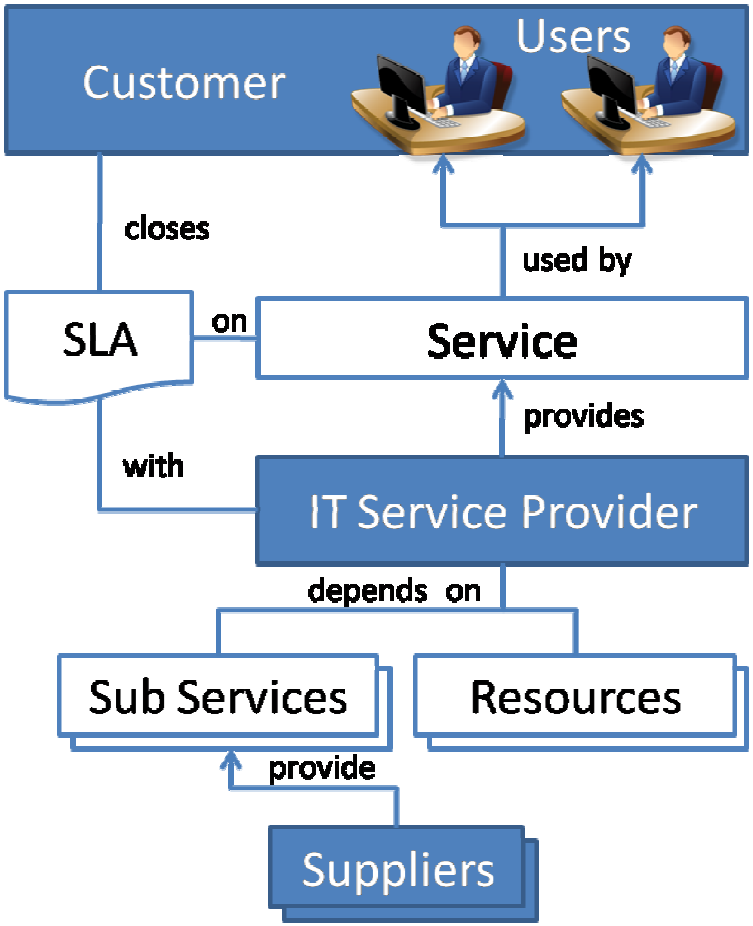
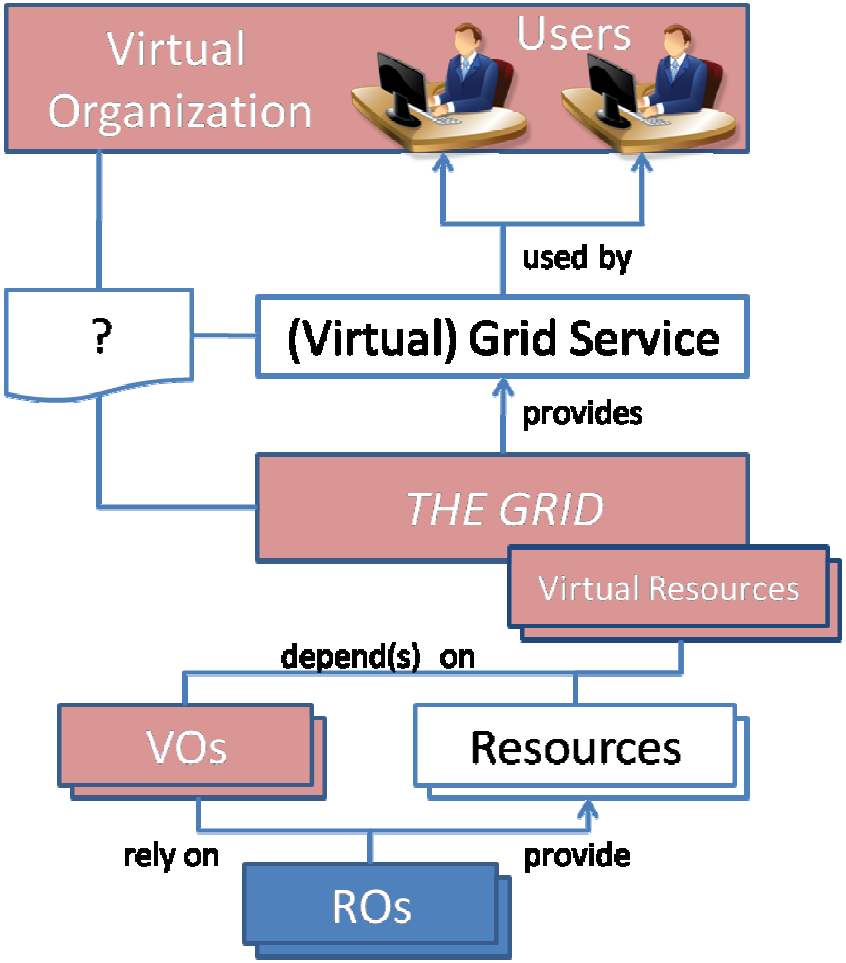
- Example: Adoption of the SLA concept for grid environments

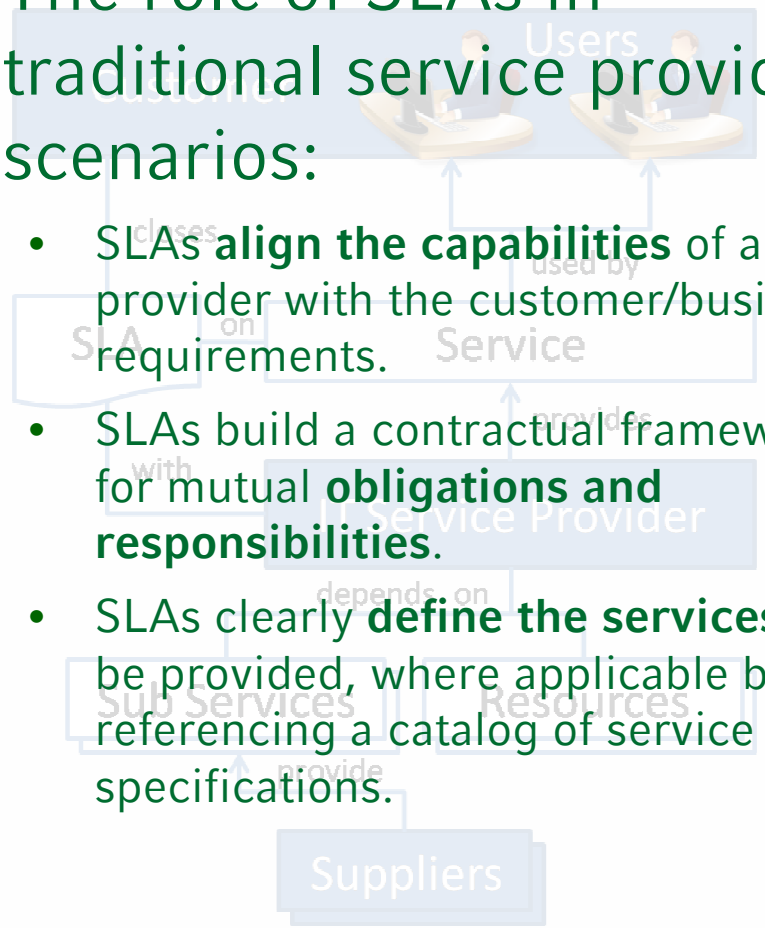
Traditional infrastructures vs. e-Infrastructures



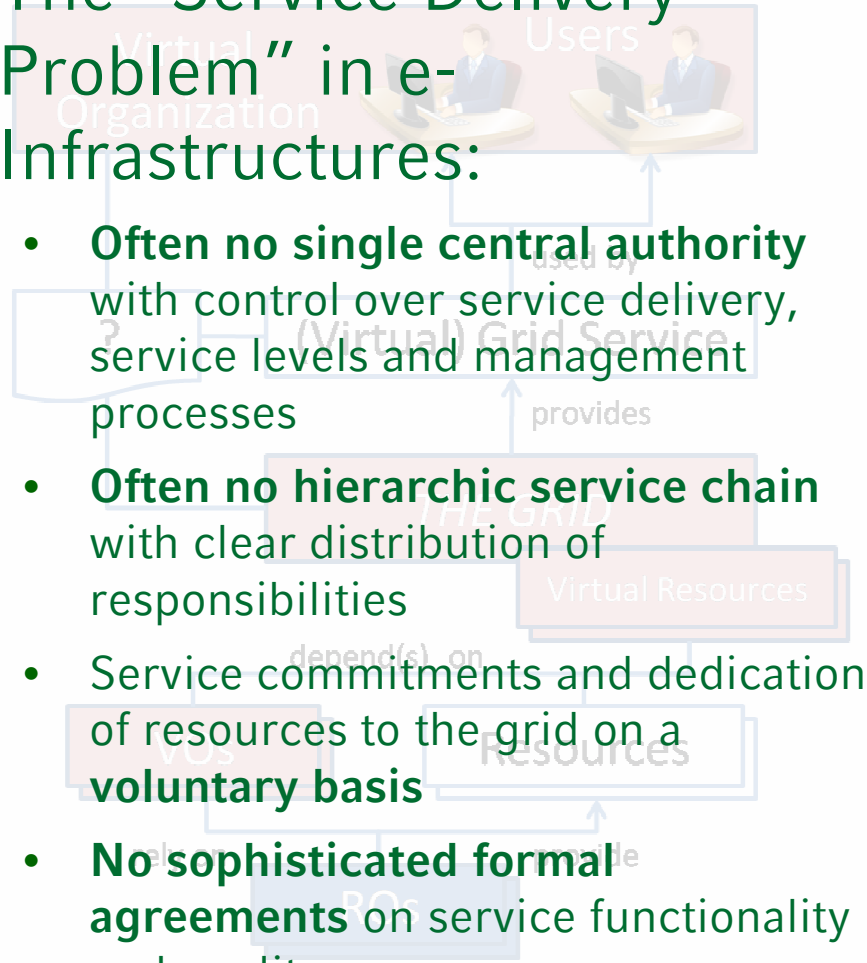


SLAs and the Service Delivery Problem in e-Infrastructures

- The role of SLAs in traditional service provider scenarios:
  - SLAs **align the capabilities** of an IT provider with the customer/business requirements.
  - SLAs build a contractual framework for mutual **obligations and responsibilities**.
  - SLAs clearly **define the services** to be provided, where applicable by referencing a catalog of service specifications.



- The "Service Delivery Problem" in e-Infrastructures:
  - **Often no single central authority** with control over service delivery, service levels and management processes
  - **Often no hierarchic service chain** with clear distribution of responsibilities
  - Service commitments and dedication of resources to the grid on a **voluntary basis**
  - **No sophisticated formal agreements** on service functionality and quality



Hypotheses

I. For the extensive success of tomorrow's e-Infrastructures in research (and industry), it is important to **adapt IT Service Management processes** and concepts for the new types of infrastructures.

II. Today, **effective solutions** in support of service delivery management (SDM) and service level management (SLM) for grids and grid-like infrastructures **are not available**.

III. One of the most critical challenges consists in an **adaptation of the SLA concept.**

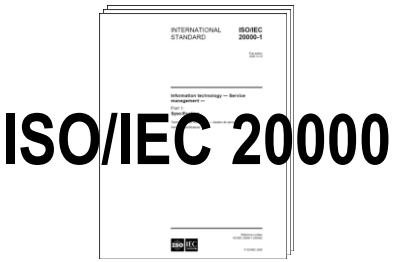
Taking benefit from existing frameworks for e-Infrastructures

Key processes and information artifacts

→ ITIL defines key processes and provides an overview of best practices and supporting concepts.

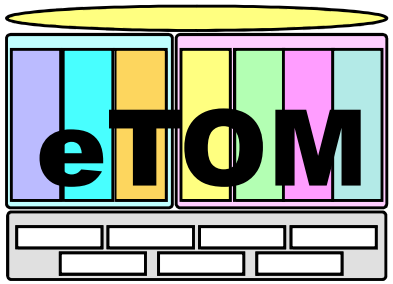
Templates and Job Aids

→ eTOM helps to make processes operational.



Minimum requirements

→ ISO/IEC 20000 provides a roadmap / checklist of things to be done



Process and information models

→ eTOM (and SID) help defining process models and a common understanding of management information

Conclusion

- Emerging challenge: Manage e-Infrastructures by **managing the services** provided on these e-Infrastructures

  → Process-oriented IT Service Management (ITSM) approach for e-Infrastructures required

- Learn from existing ITSM frameworks

  → Do not re-invent the wheel, but adopt and adapt concepts and operational practices

- Critical success factors:
  - Appropriate roadmap for ITSM in e-Infrastructures development
  - Bring together the ITSM community and the e-Infrastructure community

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