Configuration Management: an ITIL baseline Process

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FJPPL Computing Workshop

IN2P3-CC, Lyon

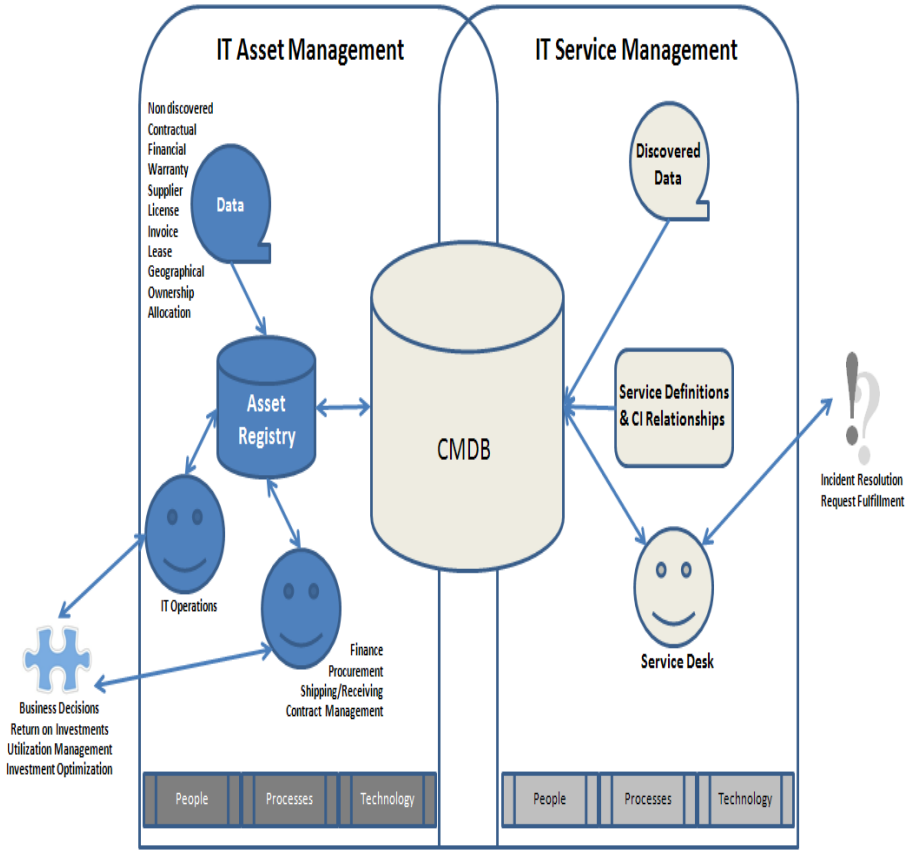
11 Mar 2015

OUTLINE

- What is the CMDB ?
- Example of ITSM blue print model
- Configuration Management (ITIL)
- Centre de Calcul IN2P3-CC : Landscape
- Target and Objectives of our project
- Architecture of the CMDB information system
- Data Model
- Data Collector
- Current status of our project / further steps
- References

WHAT IS THE CMDB ?

The configuration management database (CMDB) as conceptual IT model which reflects the infrastructure and service structural configuration (anatomy of the service).



- **CMDB** is containing the characteristics of each *configuration item* (CI) of an IT infrastructure and the relationships between the items.
- The **relationships** between the CIs can be any (important) logical expression which involved two CIs, evaluates to true and reflects a structural information.
- CMDB content is under the control of Configuration Management process

Configuration Item (CI)

A Configuration Item could be :

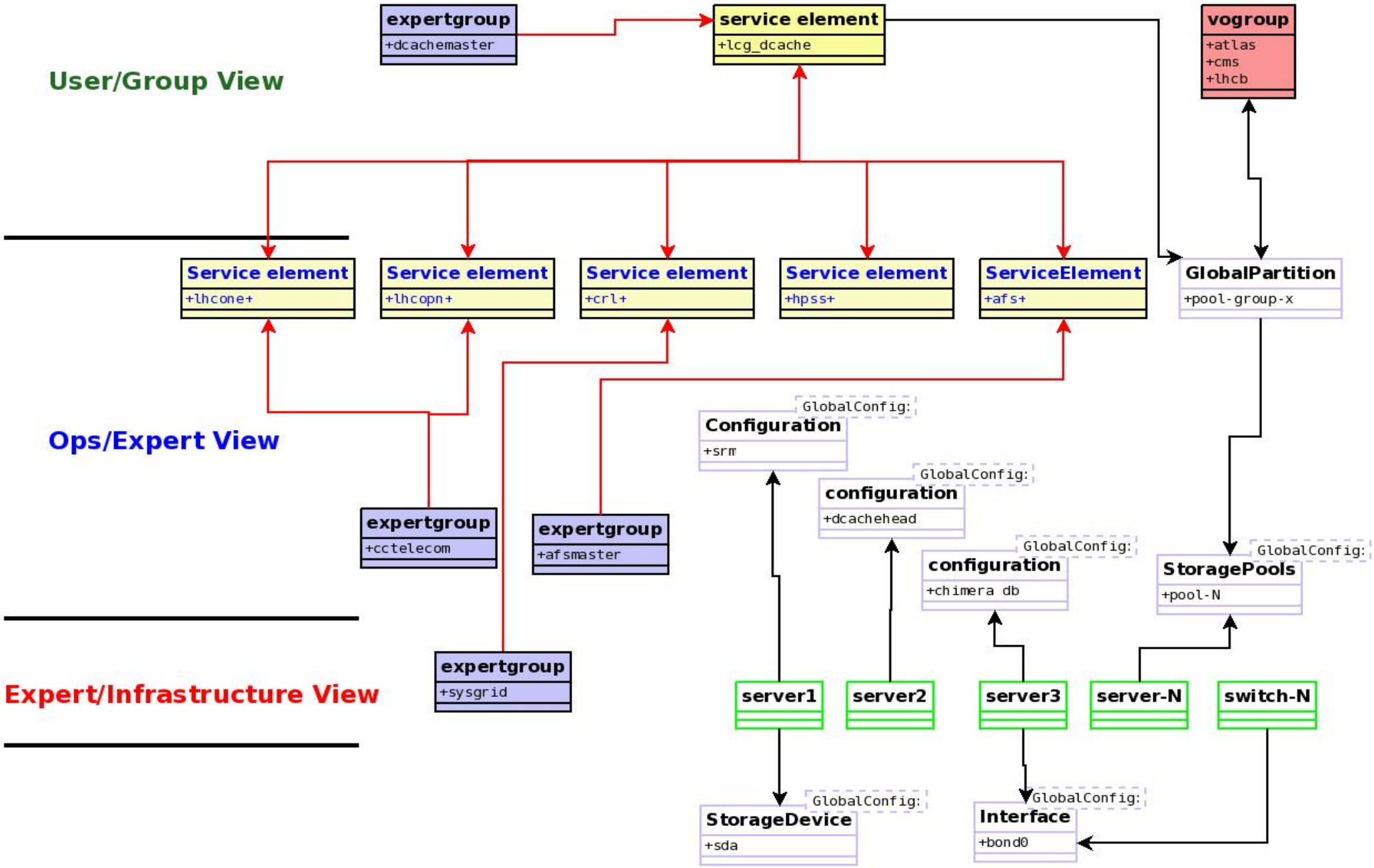
- Hardware components
  - Server
  - Box of Discs
- Storage Systems
  - NAS/NFS/GPFS
  - SAN
- Network Switch/Routers
- Distributed Systems
  - HA database cluster
  - HA webCluster
- A Technical Services
  - batch system,
  - auth system
  - Grid Service Element
- Logical Service :
  - LHCone/LHCopn
- Documentation
- Technology provider/Supplier

Service Assets

+

Service Matter experts (people)

ITSM Model : dCache example



Configuration Management Process

- **Provide the service structure blue print (CI + R)**
  - Define the context of the CIs
  - Define the level of granularity
- **Collect the information (CIs + R) and populate the CMDB**
- **Control the Change of the Information (Manual vs Auto)**
  - Track the Changes and Updates
  - Keep History
- **Audits and Feedback**
  - Validation of the information sources
  - State of the data (Stored data in CMDB vs Real Data)
  - Define metrics about the state of repository and the data collection process (KPIs)
- **Supply information to other processes**
  - **Atomic (current state)**
  - **Reports (on changes)**

Centre de Calcul d' IN2P3

~ 2000 of servers on prod, Now
~ 60 VM in Service OpenStack
~ 132 different tags usage in SysUnix DB
~> 50 Service Element

~ 836 Wns (3 generation of servers)
~ 200 of storage server (dcache,xroot)
~ 17 vobox in prod

 # cluster databases
(3 DB technologies:Oracle,MySql, Postgresql)

~4 a number of SAN/NAS

~270 Network Switches
+ Power zones
+ cooling zones
2 computer Rooms

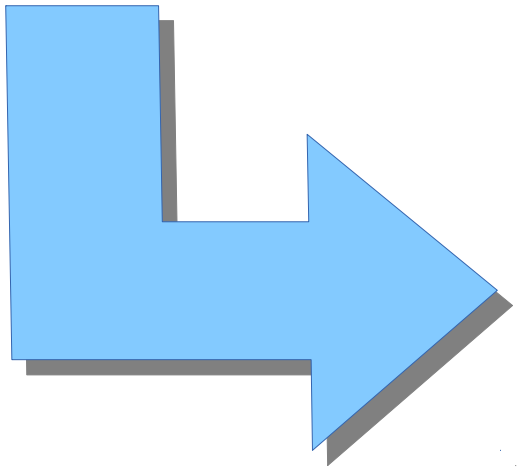
Functional Model

- **User/Group**
- **Operations Team/Support Team**
- **Service/Middleware Experts**
- **SysAdmin**
- **Network**
- **Infrastructure Team**

share vertical information Between the Functional Group about the user-service-systems

Targets and Goals of our project

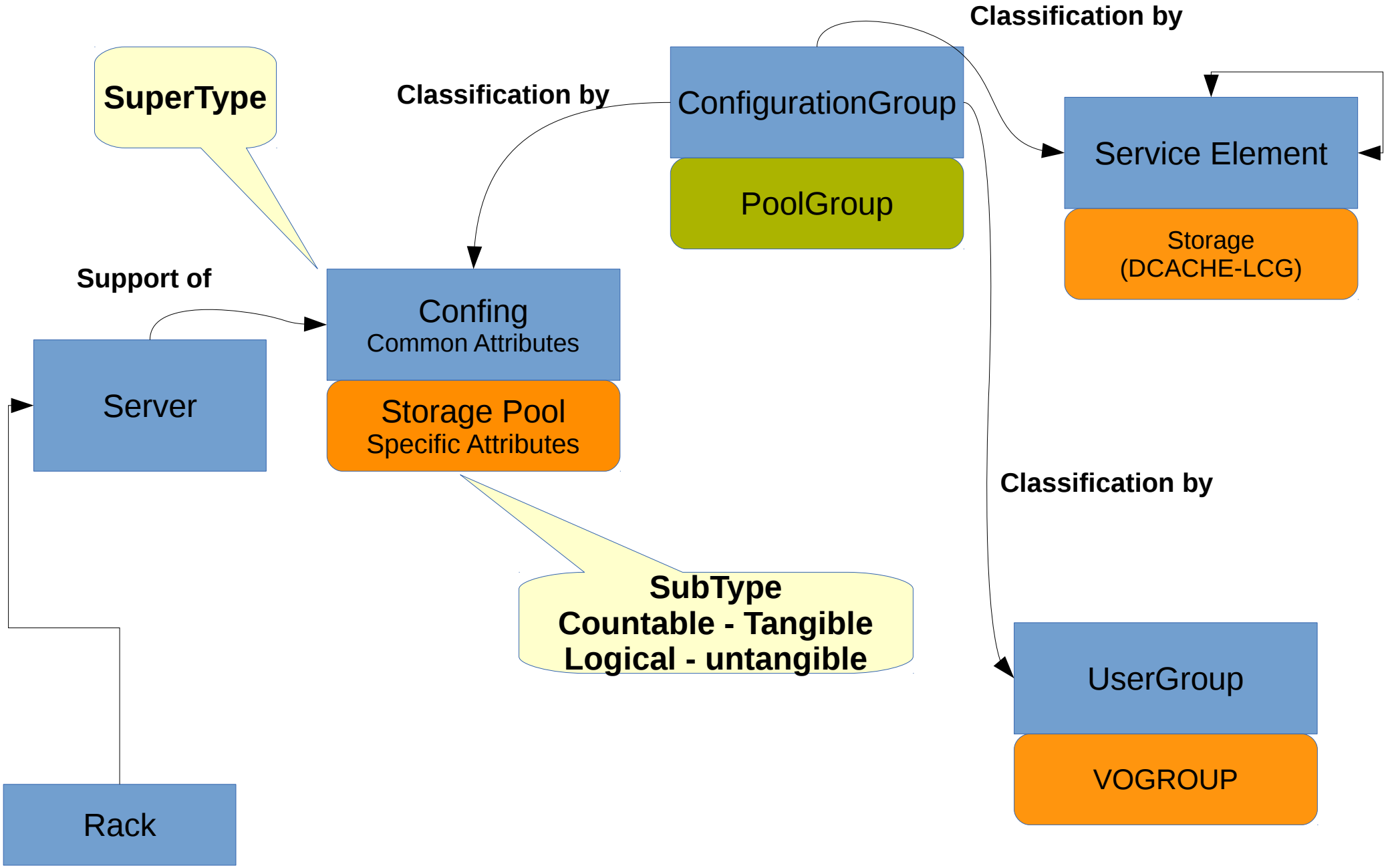
Provide a single repository of information and data exchange in order to support ITIL Processes



- **Organize existing information in different views in the framework of a CMDB conceptual model: ITSM blue print model**
- **Build common model with well define dictionaries and objects (CI): Common language and dictionary of the "services" description**
- **Identify easy a server from a service and from user-group usage (and reverse): Impact analysis**
- **Join logistics information – support Capacity Planning**
- **Establish the self Maintenance Process**

Define the foundation for a change management system

Data Model


SuperType
Classification by
ConfigurationGroup
Classification by
Service Element
PoolGroup
Storage
(DCACHE-LCG)
Support of
Confing
Common Attributes
Server
Storage Pool
Specific Attributes
Classification by
SubType
Countable - Tangible
Logical - untangible
UserGroup
VOGROUP
Rack

Data Model

- Scheme with details
- Meet the standard type of the classification scheme
- Description of the Service Element (Technical Service)
- Easy adaptation (e.g. supertypes)
- Covers well the distributed system structure (e.g. storage, batch, load balance,…, etc)
- Scheme too complex for "atomic services" (e.g. vobox)

Context Diagram

Sources of Information

Lavoisier : Customized Views

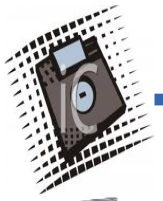
CMDB System

Rane

Collector: Lavoisier

SmurfDB

Service configuration



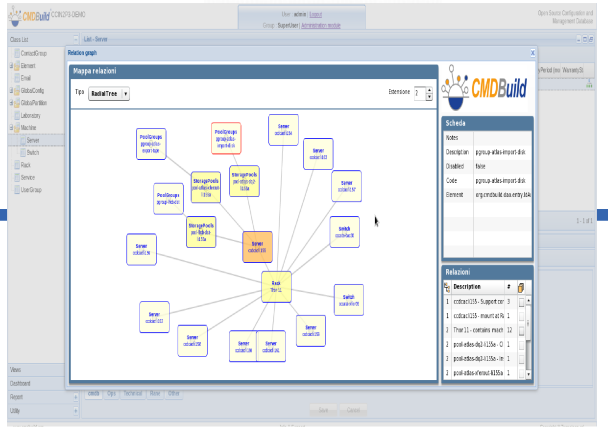
svn

Puppet-facts

Lavoisier CMBDBuild Plugin

Backend-db (Postgres)

Business Logic Workflow engine



User Interface

Collector System layers

Smurf Puppet dCache RANE DNS Users Network services

Collect and structure the data

Specific source of data at IN23-CC

mysql rest/json svn/xml csv oracle oracle http/text file/xml

Crossing and reformatting

Local cmdb schema

Detection of the changes

Local update Rules

Preserve history, detect orphan objects

Client web service

Specific software CMDBuild

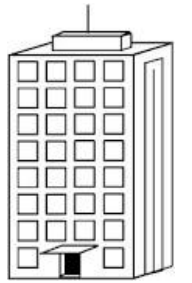
Java

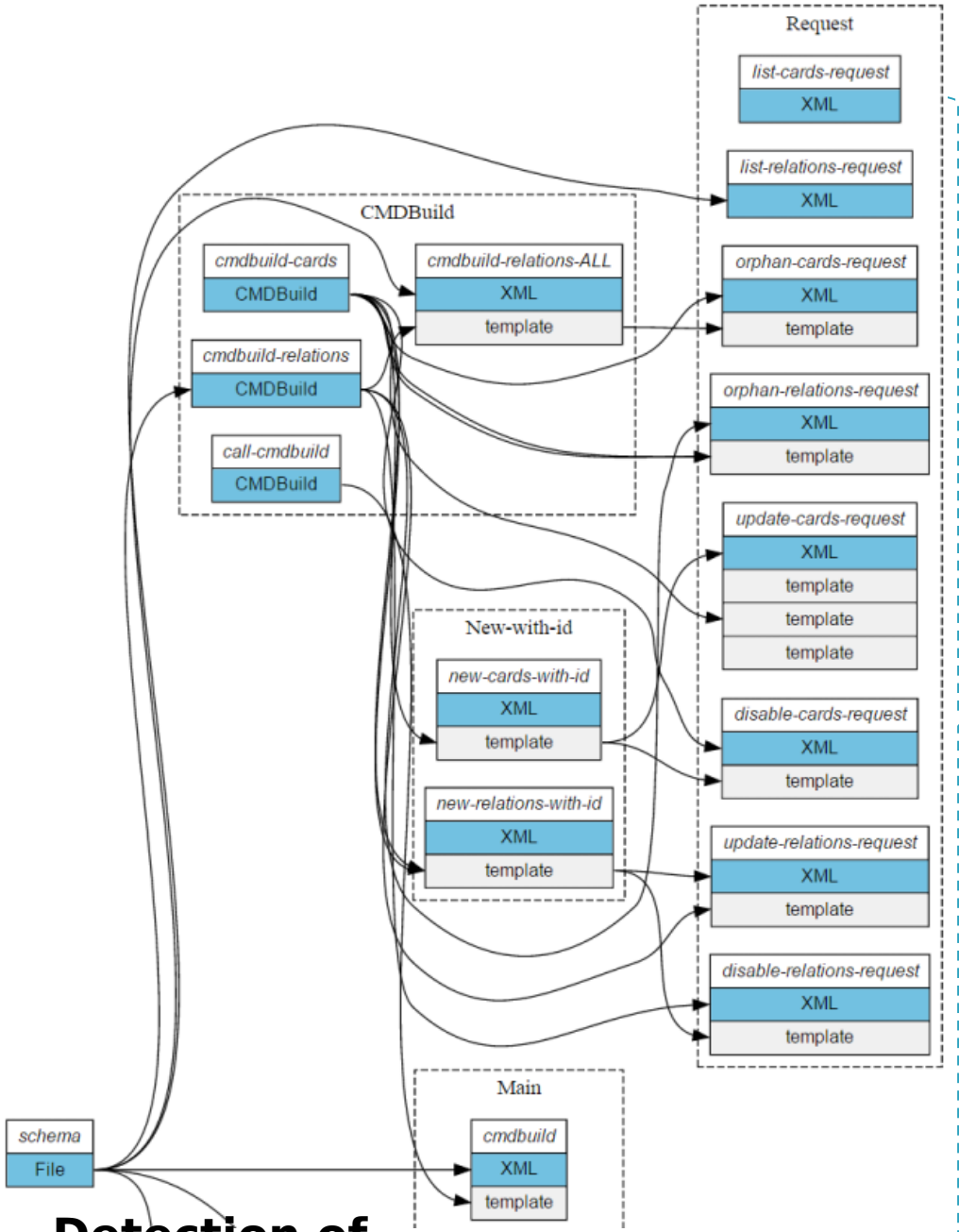
CMDBuild®

Open Source configuration and management database

Already profitable development effort

CMDB

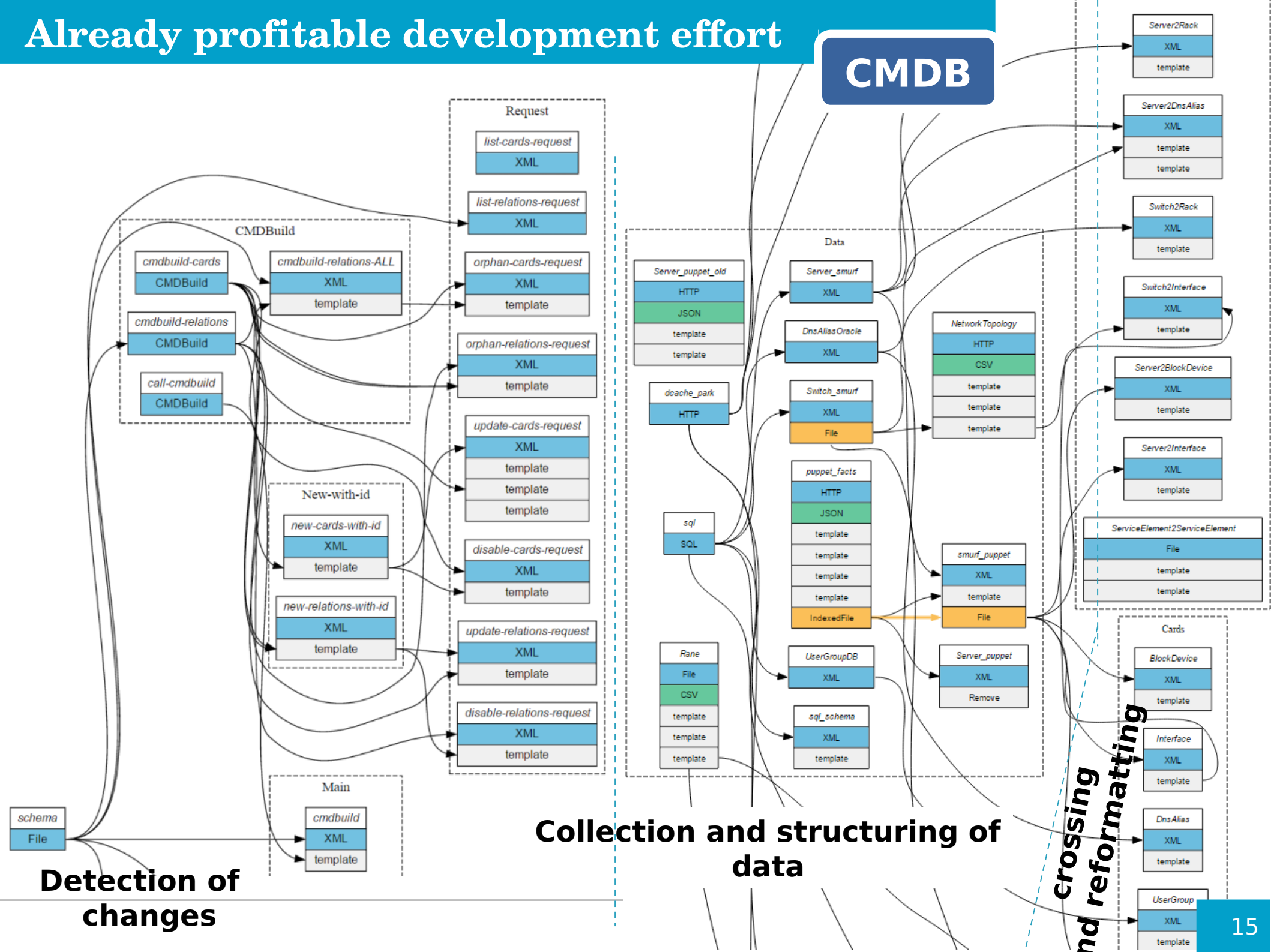




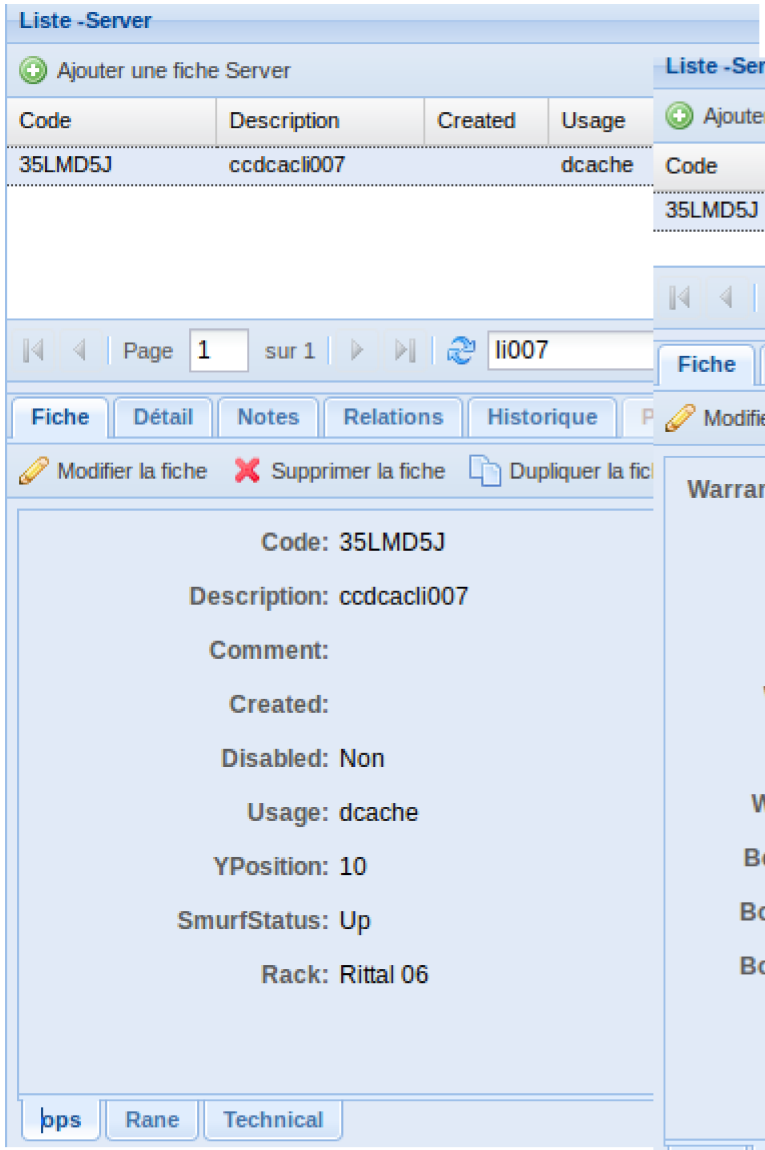
Detection of The changes

- **Developed with the new Lavoisier Template language**
- **«business logic» of the collector is an Application of Lavoisier**
- **Small dependency layer with the third party software**

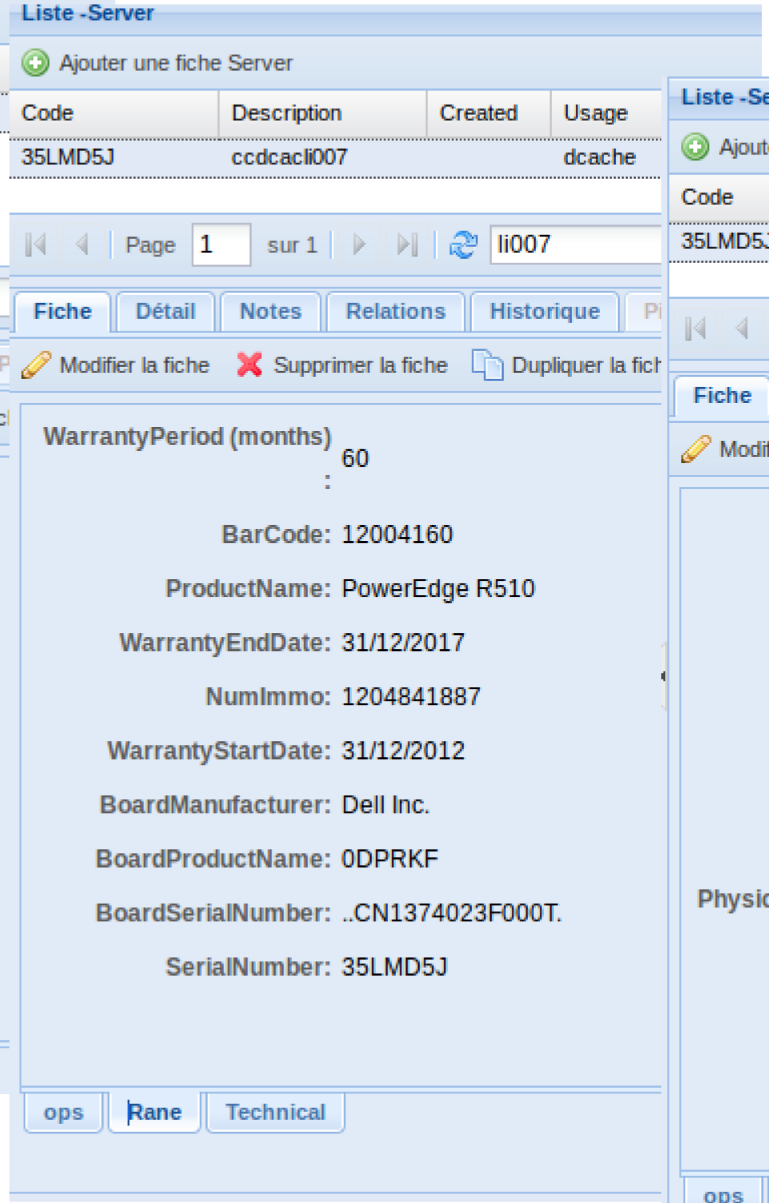
Already profitable development effort



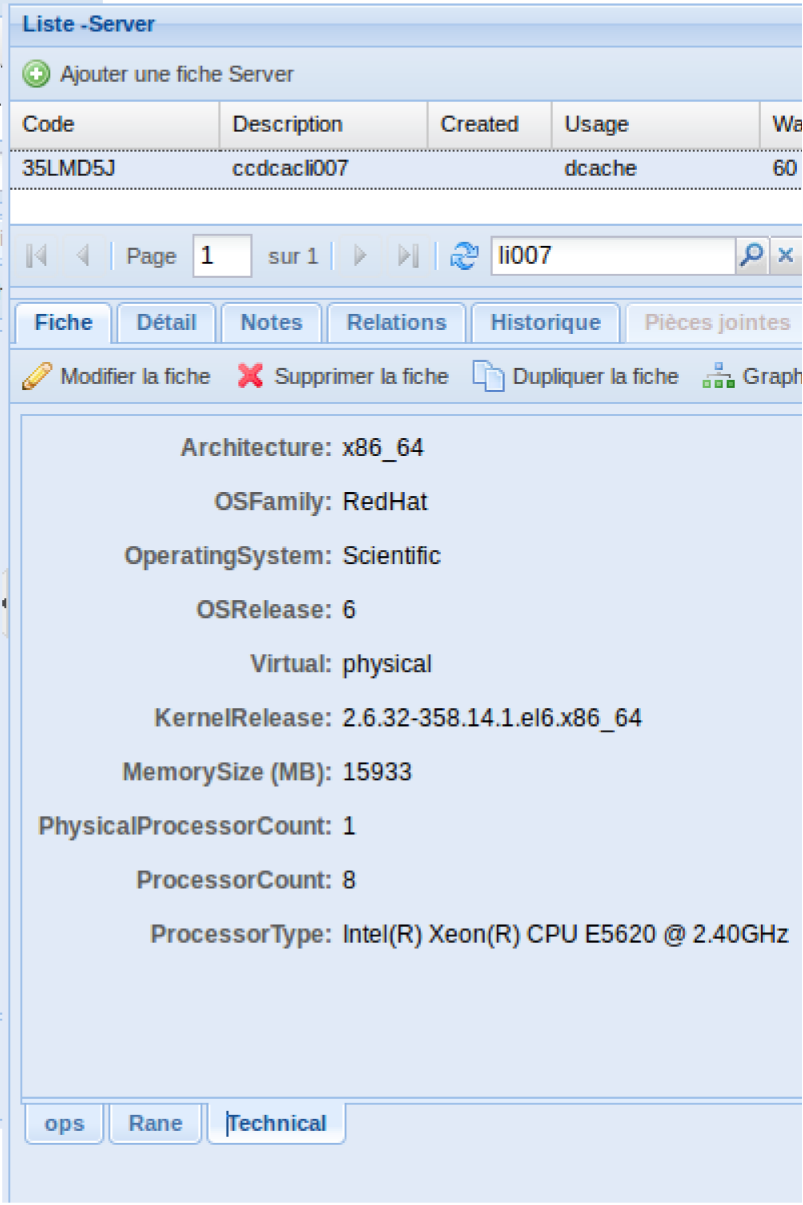
Example of data Crossing



CCSMURF

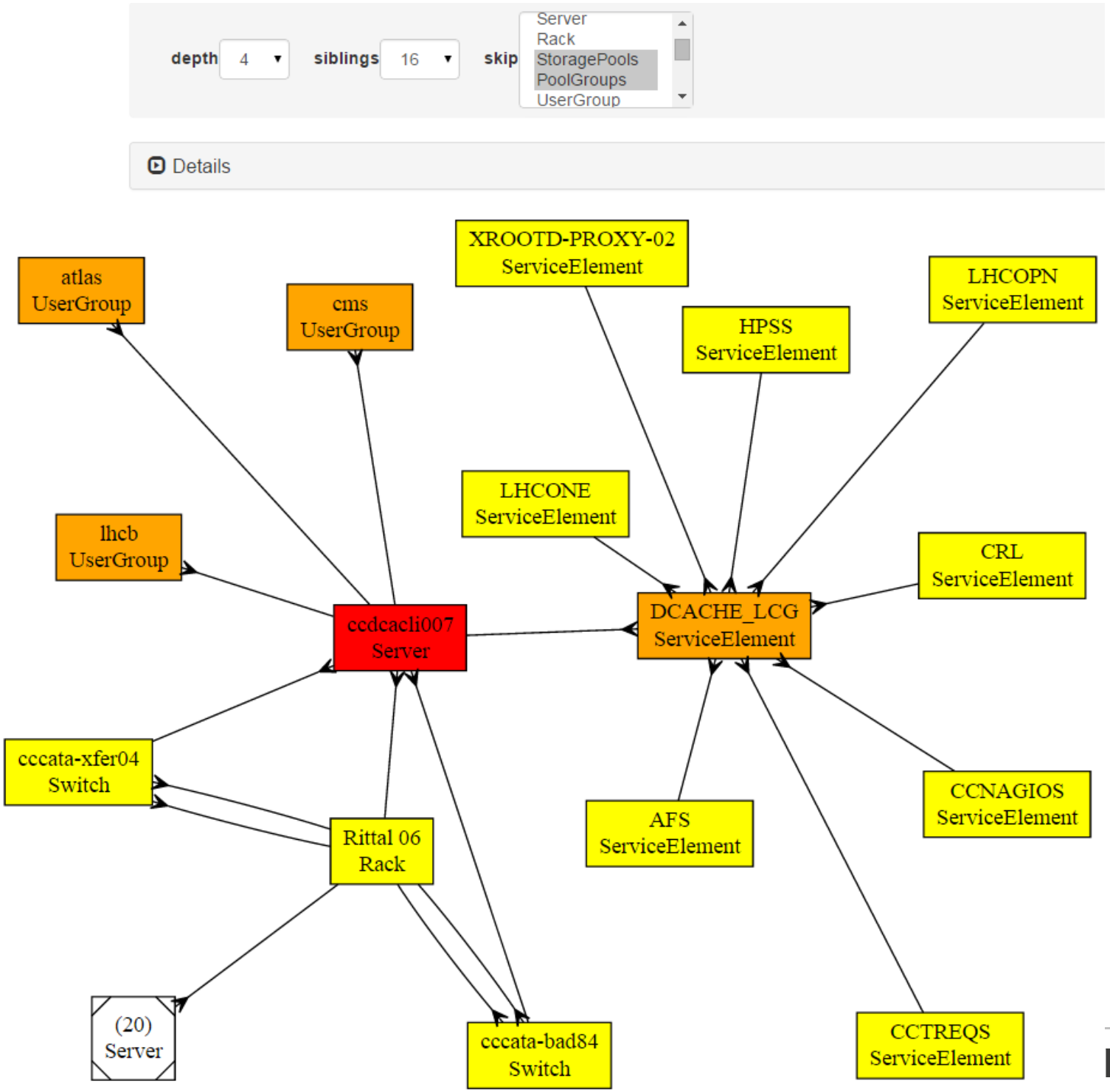


RANE+PuppetFacts



PuppetFacts

Graph Generated by Lavoisier for impact analysis



- **Current Status**
  - Data Model
  - Identify Sources
  - CMDBuild low level connector
  - CMDBuild - Lavoisier collector
    - Service Family
    - Auto population
  - Pre-prod test instance

- **Further Steps**
  - Revision of data model
    - auto vs manual class
  - Validations of Lavoisier connector with high number of CIs
  - Key Performance Indicator (Process)
  - Validation of sources
  - Include more services

References

Books and Guides

- *The CMDB Imperative* Glenn O'Donnell and Carlos Casanova- Prentice *(2009)*
- *The IT Skeptic Looks at CMDB , **Rob Englan**d (14 April 2009)*
- *Basic Service Management, **Rob England** (2011)*
- *Step-by-Step Guide to Building a CMDB - **BMC Software** (2008)*
- *ITIL Capacity Management,Larry Klosterboer - **IBM Press** (2011)*
- *The Data Model Resource Book: Volume 3: Universal Patterns for Data Modelling*

  *Len Silverston, Paul Agnew – **WILEY** (2009)*

Thank for your attention!

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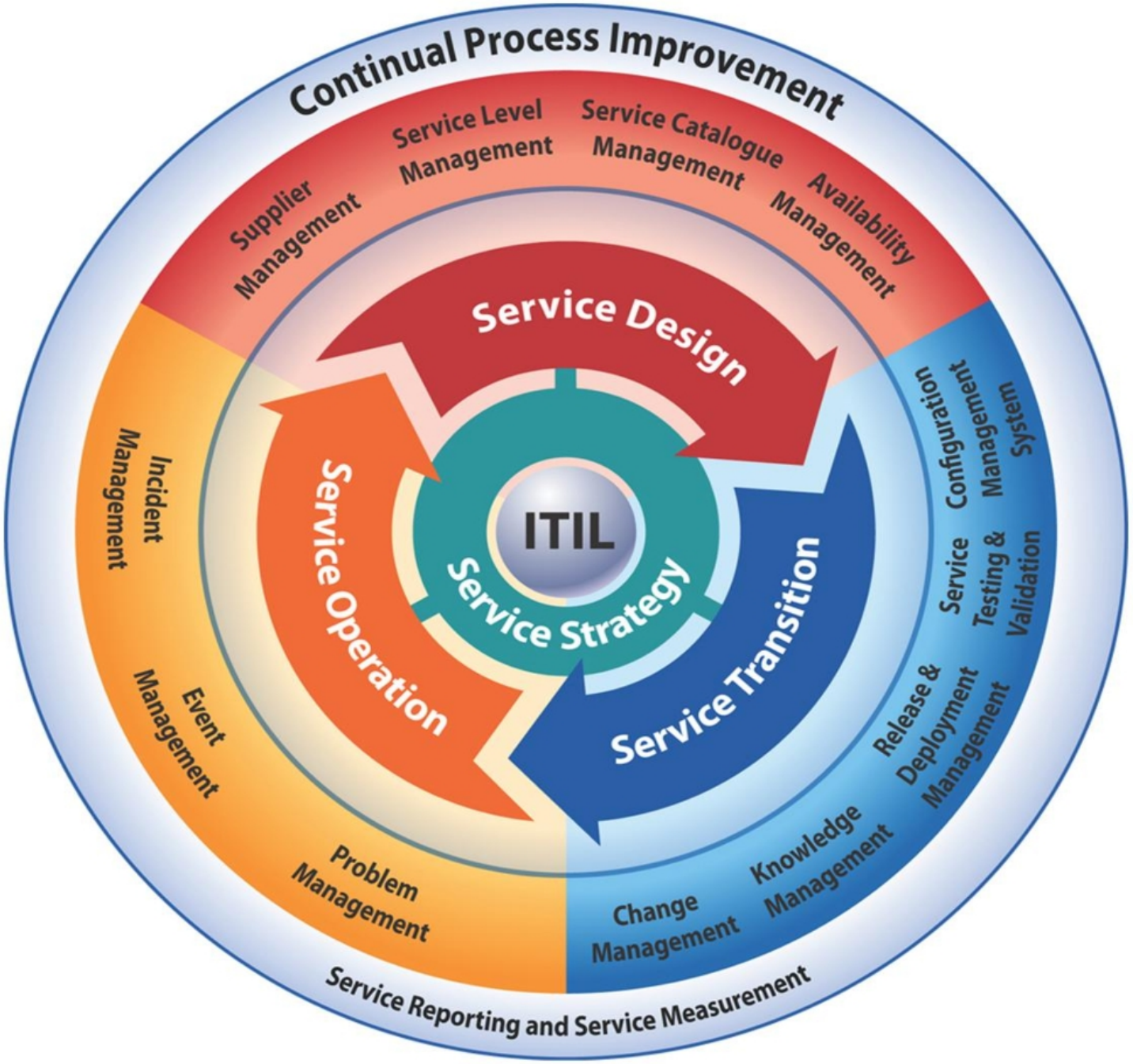
Backup Slides

ITIL Best Practice

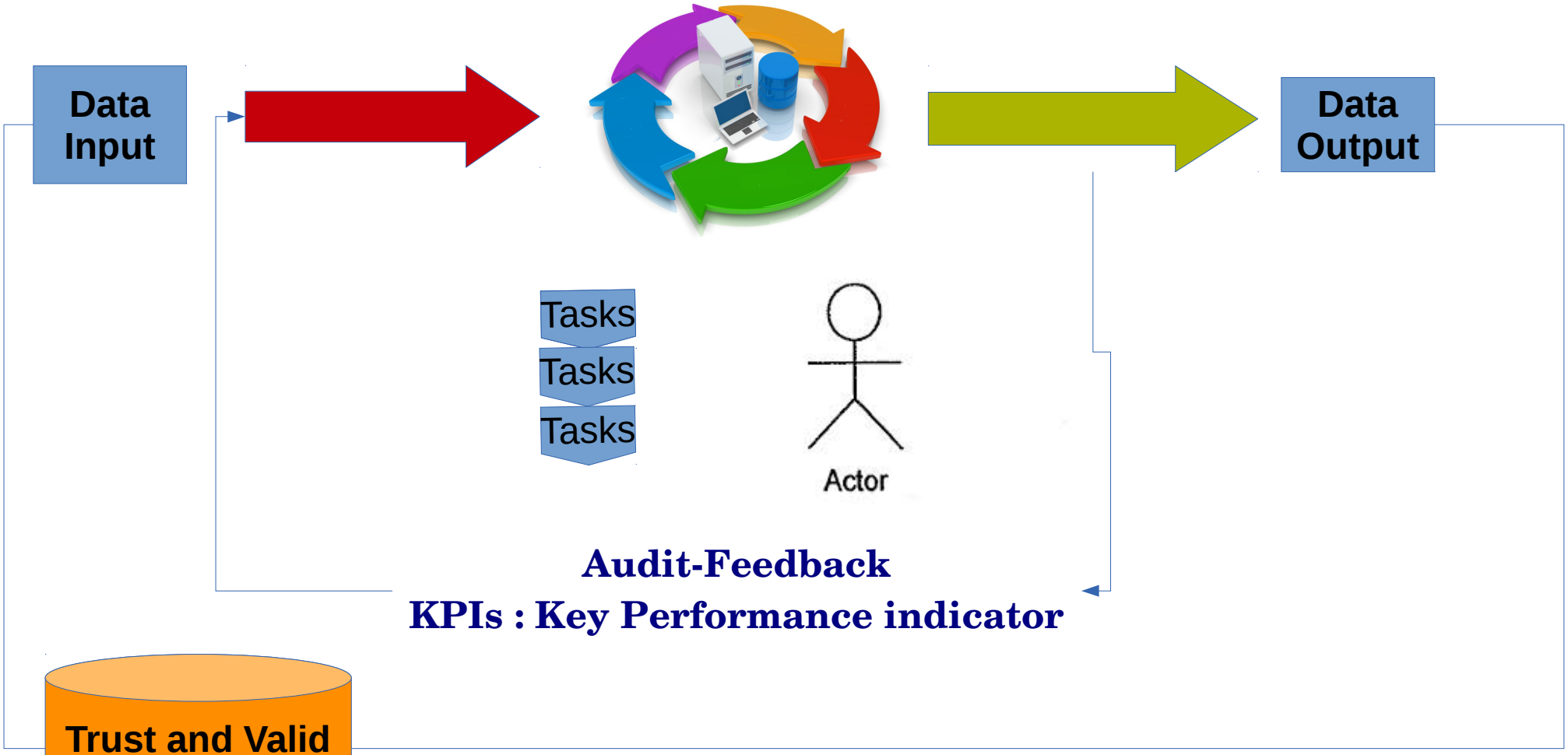
- Information Technology Infrastructure Library (ITIL) :
  - « set of practices for IT service management (ITSM) that focuses on aligning IT services with the needs of business ».
  - Prelude for ISO/IEC 20000

- Key points of ITIL Best Practice
  - Define the Life Circle of a IT service
  - Clarify the Responsibility boundaries amongst the stakeholders (user – Service Manager – Experts)
  - Process Oriented Service Delivery and Service Support Model

Define the Life Circle of a IT service



ITIL Process



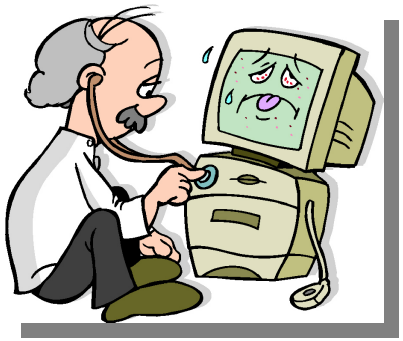
- The description of the process should be defined
- But it is not 100 % necessary the process to be automatic and based on specific tools

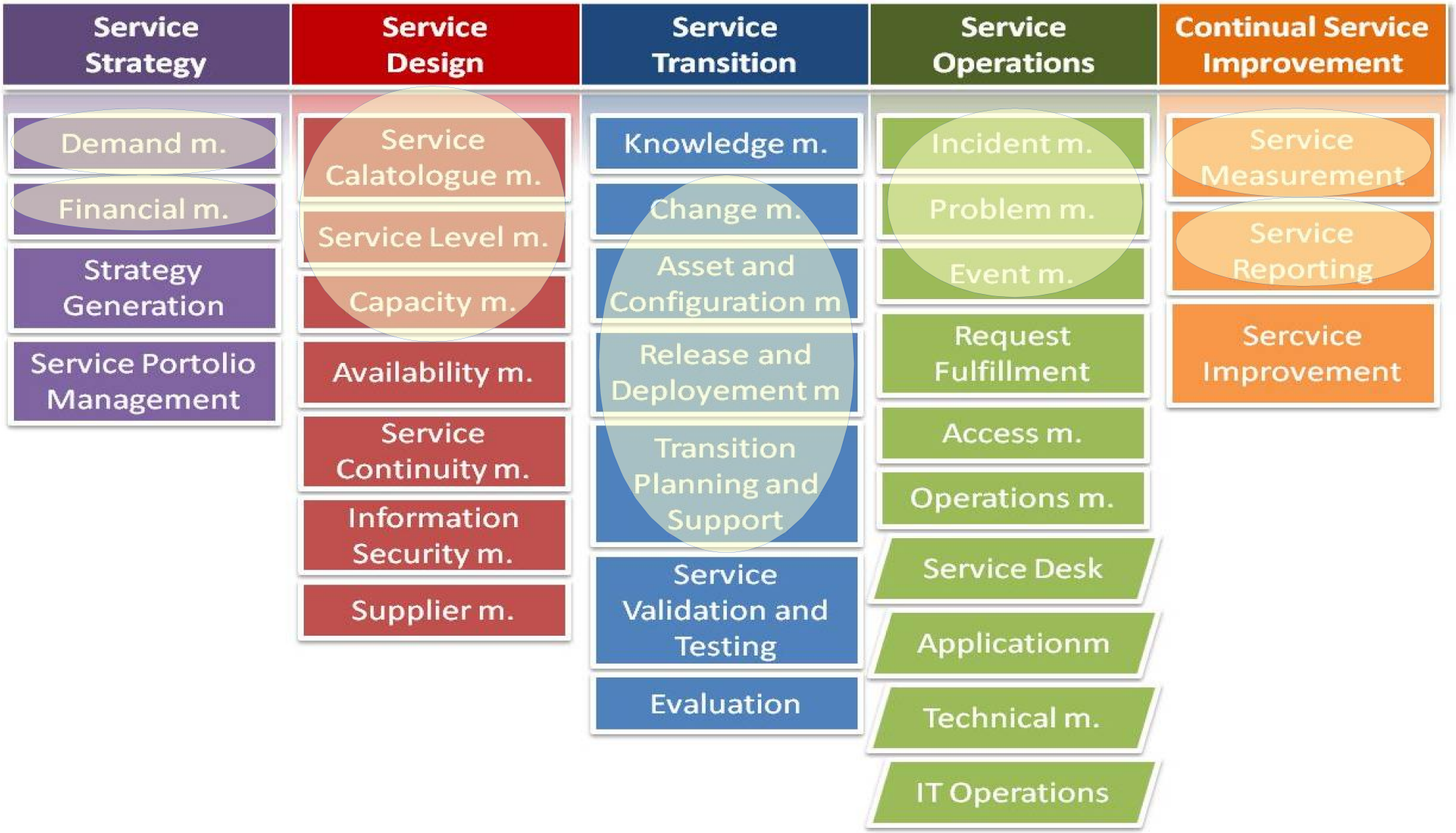
Stakeholder Boundaries

User-UserGroup

Service Manager®

Service/ Experts



- *Represents all provided services to a User/Group and is responsible for all Service*
- *Support and Service Delivery actions taken to ensure they meet User/Group needs and IT Requirements (performance,capacity, availability of the service).*
- *Responsible for overall USER/GROUP Satisfaction.*

ITIL PROCESS