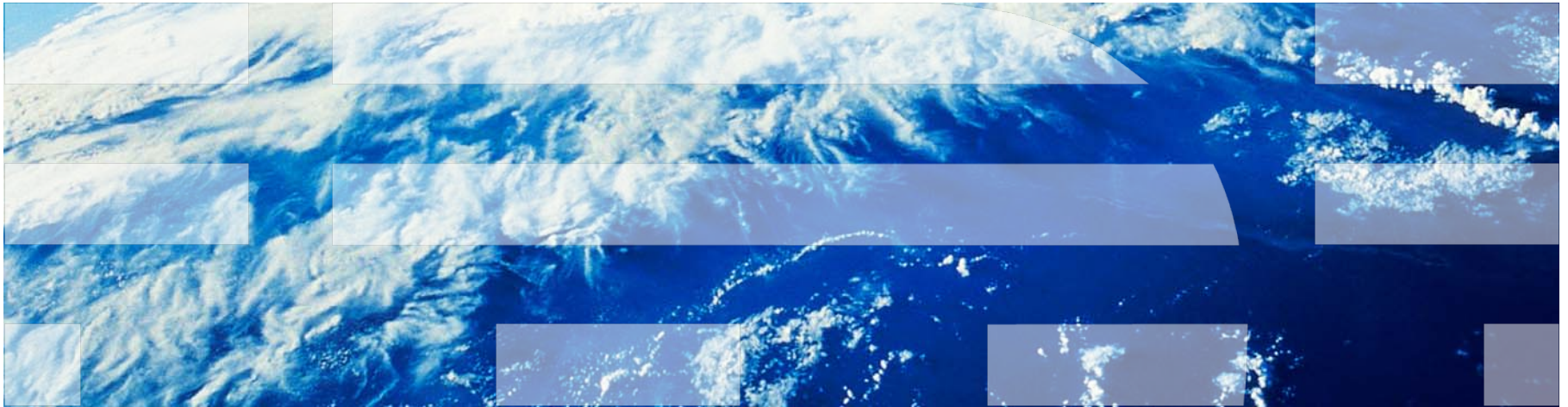


# ITIL based Service Management and Service Orchestration

## Cloud Computing and Service Management



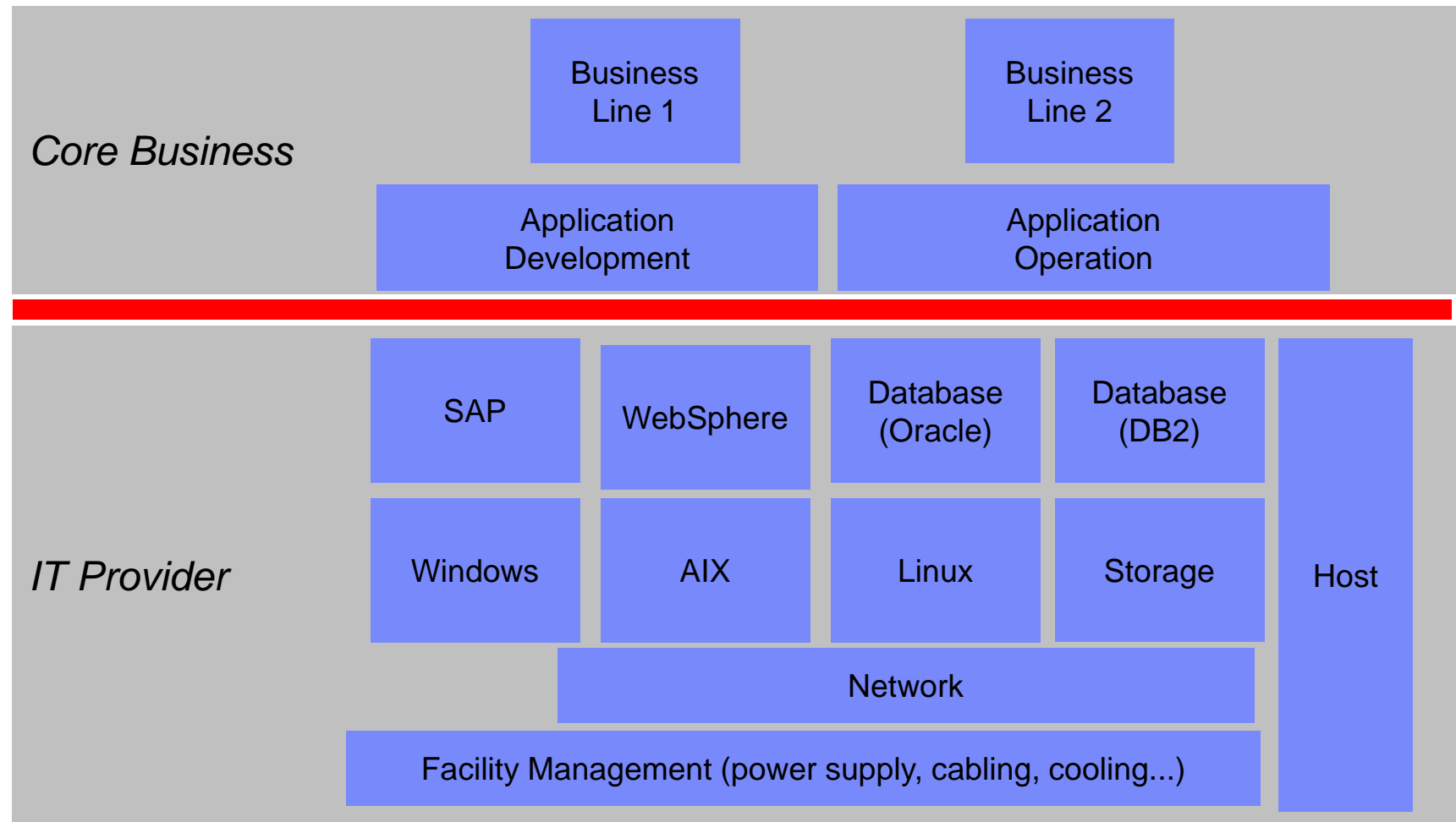
# Agenda

1. Introduction
  - Problem Area
  - IT Infrastructure Library (ITIL)
2. IT Service Management – The Heart of Cloud Computing
  - ITIL and Cloud Computing
  - Customer Example
3. Tivoli Service Automation Manager Concepts
  - Realization of Infrastructure and Cloud Services
  - Standardization of Cloud Services
4. Summary

# Agenda

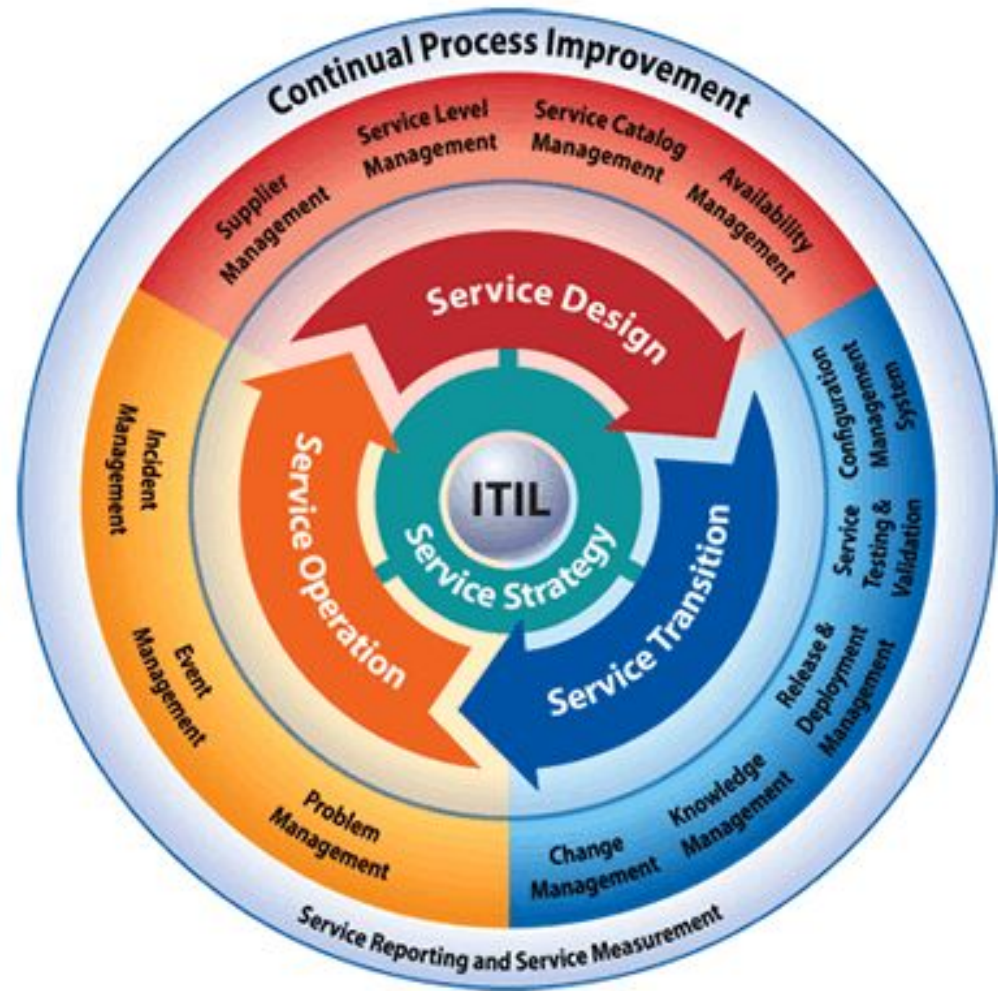
## View on the IT Organization of a Typical Enterprise

YouNameIt Inc.



## Introduction to IT Infrastructure Library (ITIL)

- Founded in the 80s
- Collection of “Best Practices” or “Good Practices”
  - Version 1 1989
  - Version 2 2000
  - Version 3 2007
- Framework of processes to manage IT as Service
- Becoming more and more relevant
- “Implementations” from different vendors available for different industries
  - Microsoft, Oracle, HP, IBM





## Objectives of ITIL

- Why ITIL?
  - Reduction of costs and improvement of service quality
  - Collection of knowledge coming from experts, consultants and practitioners
  - Accepted processes of IT Service Management as “Good Practices”
- What are the benefits of ITIL?
  - Better utilization and productivity of the service provider's resources
    - Assets (server, storage, network, facility)
    - Skill and knowledge of employees
  - Less effort for the development of new services
- Focus on Performance Indicators
  - Service must be **Measurable**
  - Service must be **Auditable**
  - Service must be **Compliant** to Service Level Agreements (SLA)

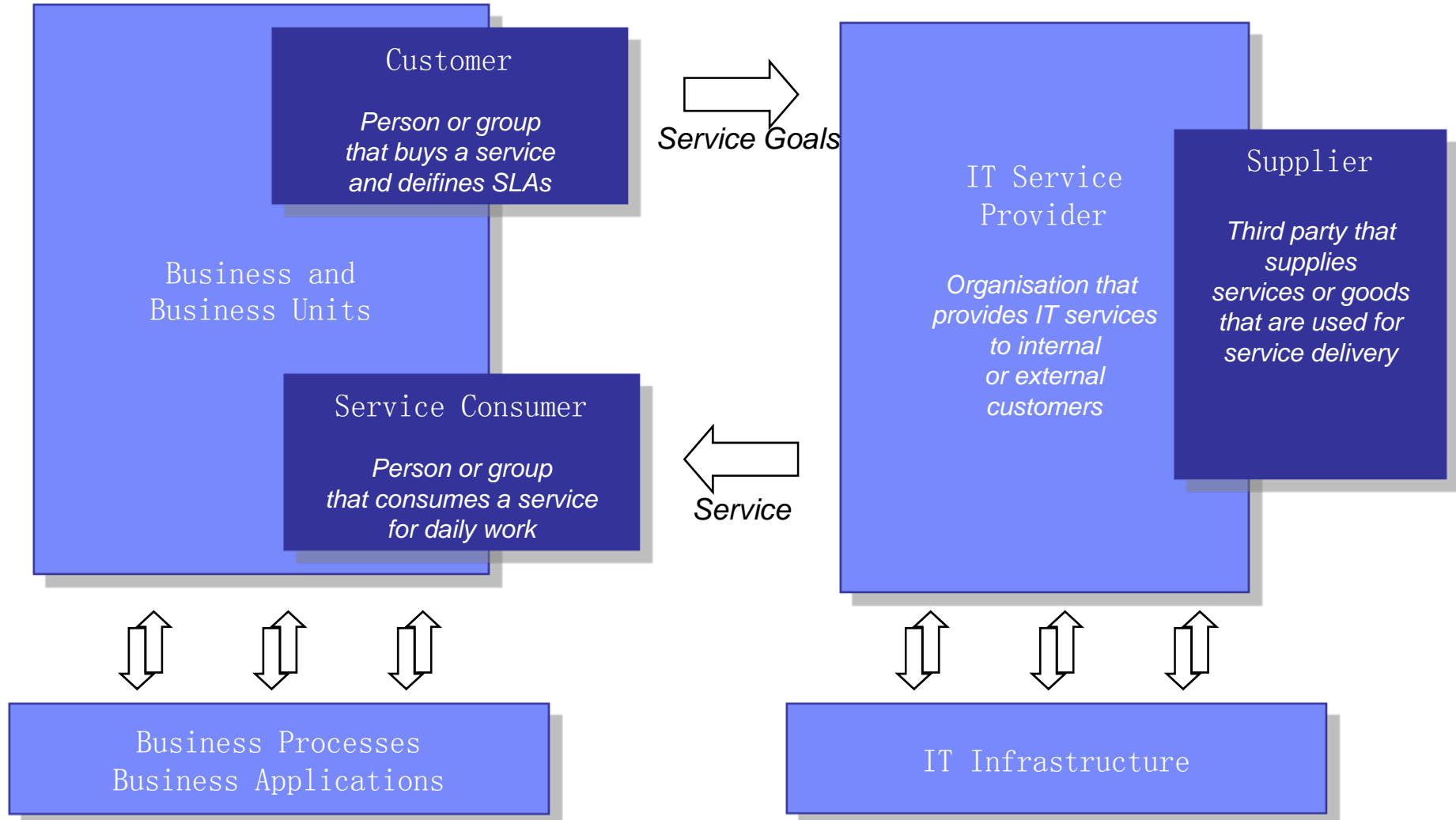
## ITIL Version 3

*IT Service Management is the implementation and administration of quality based IT services to fulfill business requirements.*

*IT Service Management is performed by service providers using functions, persons and processes.*

- Focus on the Service Life Cycle
  - Service Life Cycle is not a new concept in the IT, but in the main focus of attention of version 3
- Focus on the Four “Ps”
  - People
  - Products (service)
  - Processes
  - Partners

## The Roles within IT Service Management



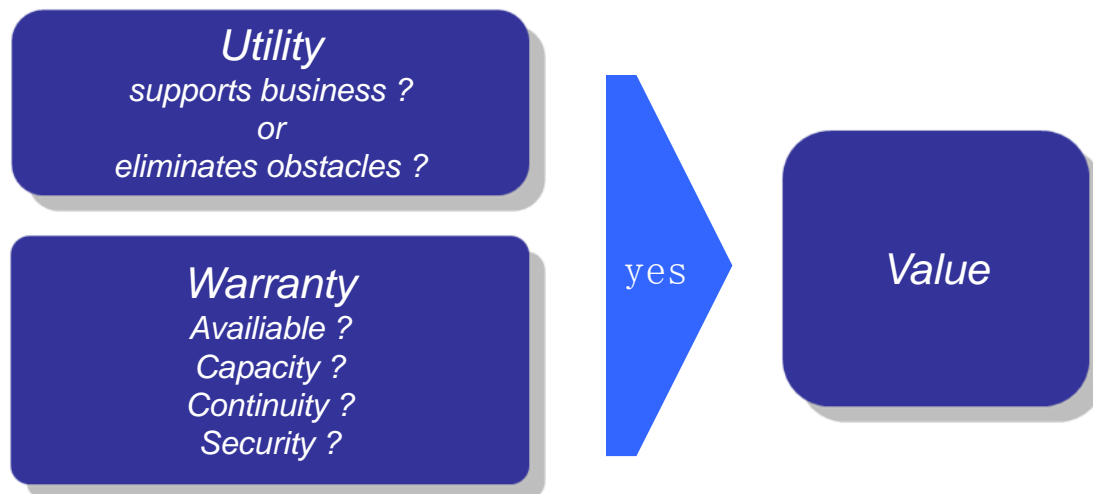
Quelle: itSMF ITIL V3 Glossary

## The Notion of an IT Service according ITIL

### *Definition:*

*A service provides the possibility to deliver value to a customer. The value supports a customer to reach business objectives.*

- Characteristics of 'a service'
  - produces a expected output
  - provides added value
  - continious improvement of output
- Value of a service
  - Service Utility – What
  - Service Warranty – How



Quelle: OGC Service Strategy

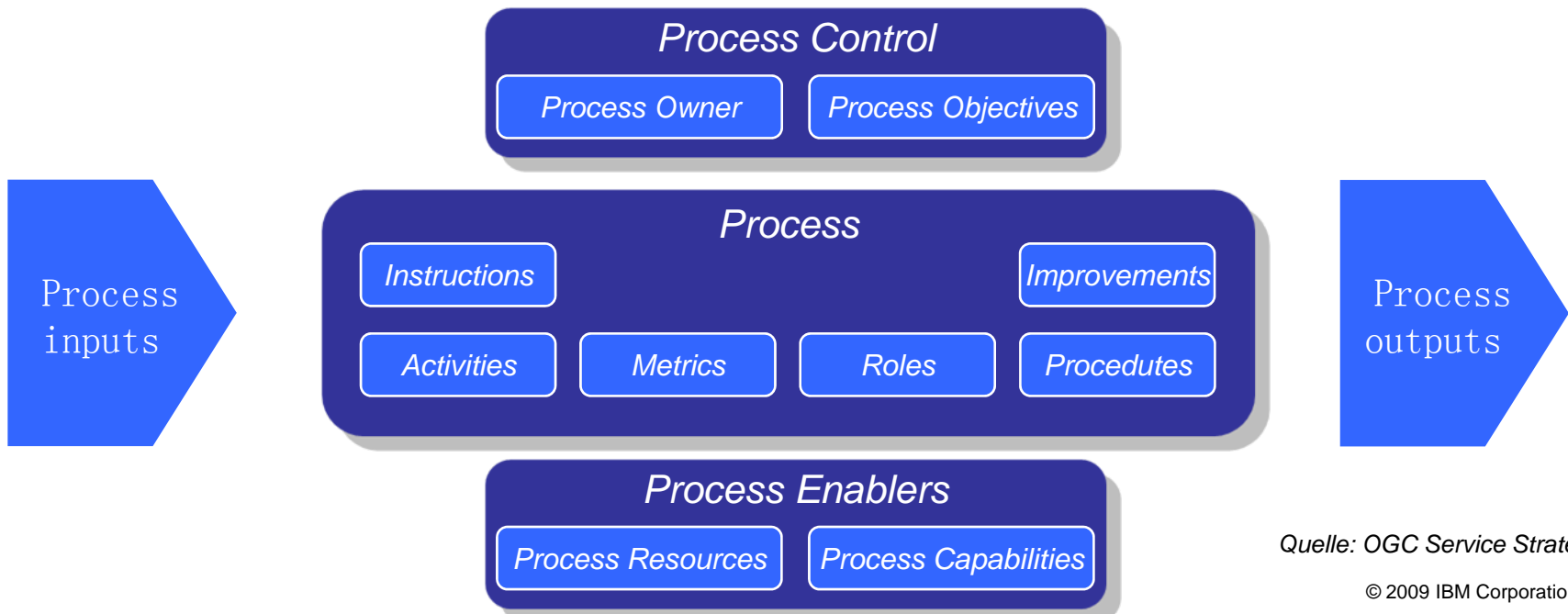


## The Notion of a Process according ITIL

### *Definition:*

*A process is a structured set of activities to produce a well defined output*

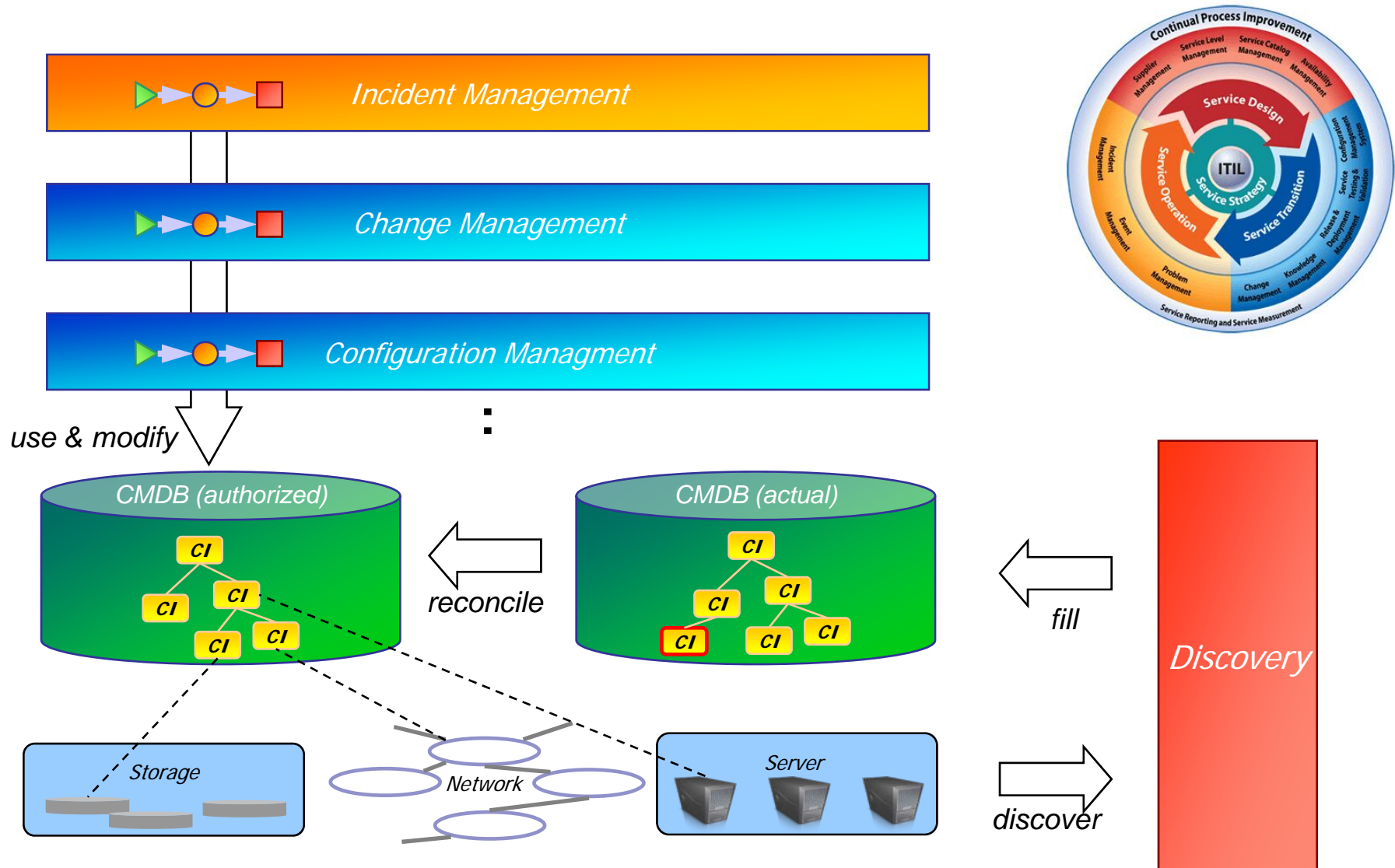
- Characteristics of a process
  - produces a defined output
  - processes are measurable
  - across organisation and functions
  - continuous improvement of output
- Roles within Process
  - Set of responsibilities assigned to a person or group
  - A person or team can be part of one or more roles



Quelle: OGC Service Strategy

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# The Elements and Principles of ITIL and Service Management



# Agenda

## 1. Introduction

- Problem Area
- IT Infrastructure Library (ITIL)

## 2. IT Service Management – The Heart of Cloud Computing

- ITIL and Cloud Computing
- Customer Example

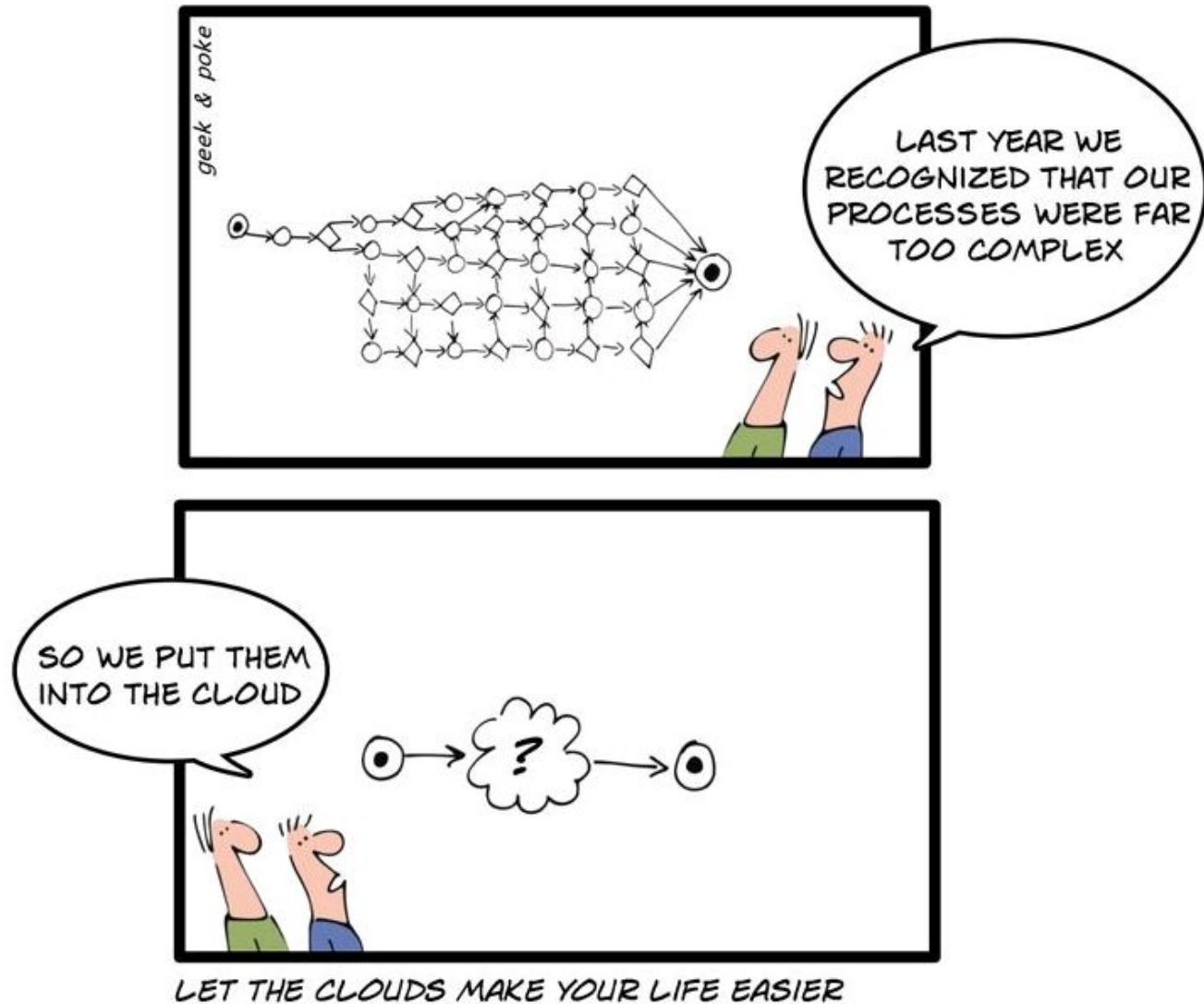
## 3. Tivoli Service Automation Manager Concepts

- Realization of Infrastructure and Cloud Services
- Standardization of Cloud Services

## 4. Summary

# Agenda

## Does Cloud Computing helps ?

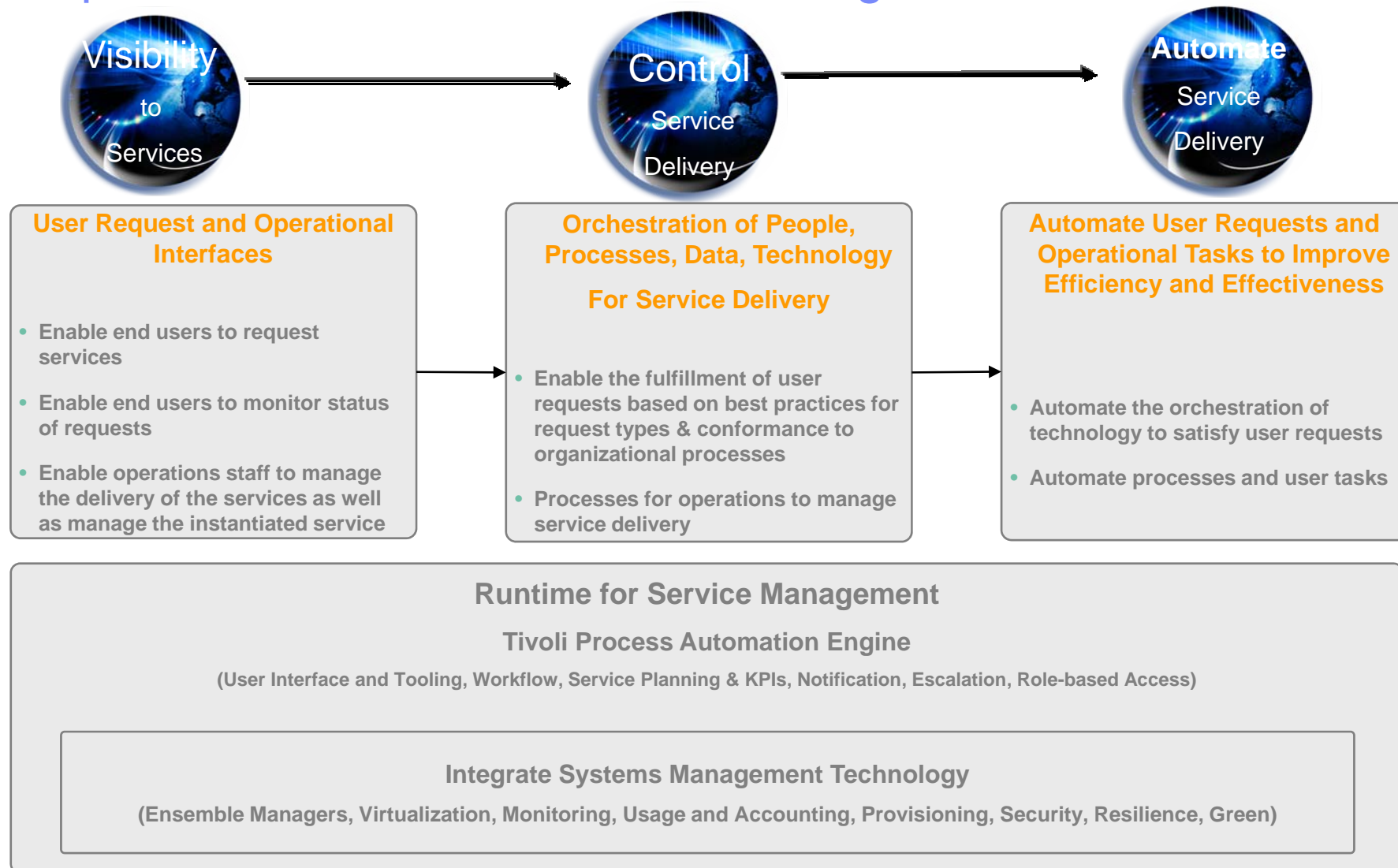


## Integration of Service Management and Cloud Computing or adapting Cloud Computing concepts to traditional IT

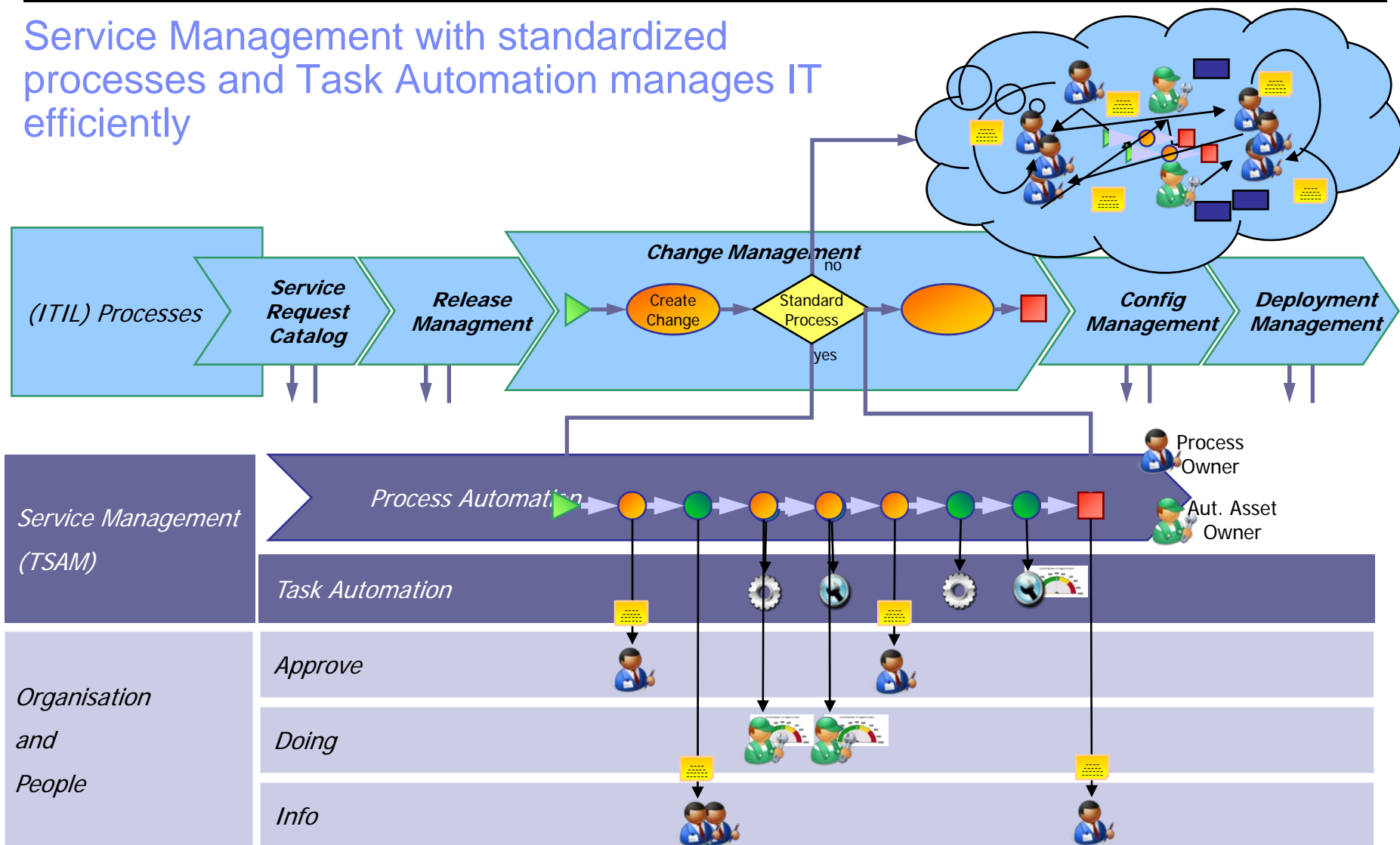
- Motivation
  - Improvement of time-to-Service 10 min vs. 10 weeks
  - Cost and labor reduction
- Approach
  - Disruptive: Creation of a parallel cloud environment
  - Evolutionary: transformation from a technology oriented to a service oriented view



# Capabilities needed for Service Management



## Service Management with standardized processes and Task Automation manages IT efficiently



TSAM provides flexibility by introducing task automation stepwise

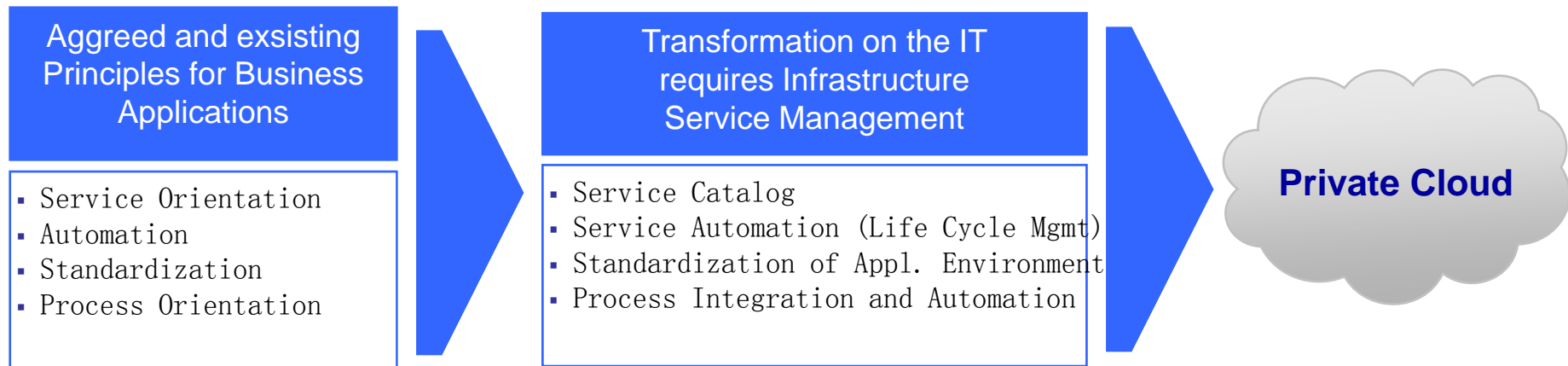
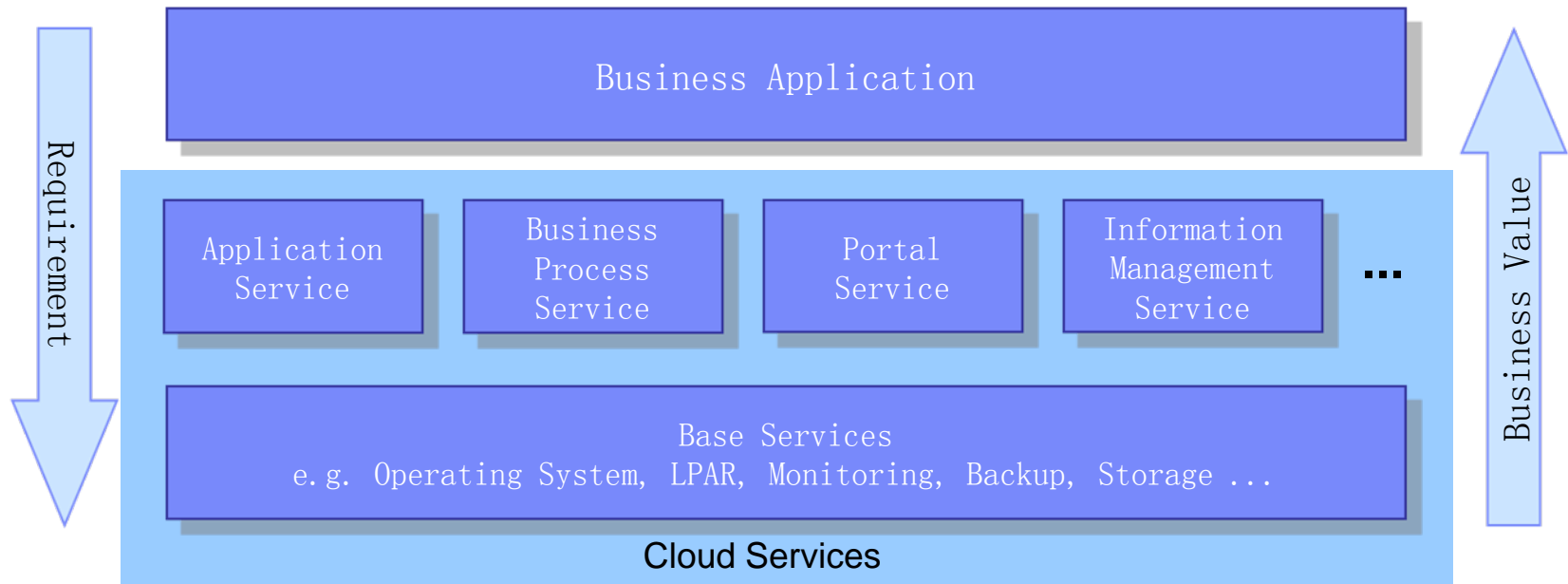
The screenshot displays a WebSphere Portal interface. On the left, a navigation menu includes links for Project, Department, Release, Deployment Name, and Organization. The main content area shows a table with one entry titled 'Production Env'. The description for this entry states: 'Über diesen Eintrag können eine Portal Infrastruktur bestellen, bes (IBM HTTP Server), dem Deploym Cluster aus 1 bis N gemanageten'. The price is listed as 0.00 EUR. Below the table, there are fields for 'Staging Tests' (4969), 'Release' (6.1.0.3), 'MyTest', and 'Portal System Test'. A 'Add to Favorites' button is visible at the bottom right of the table.

On the right side of the slide, a diagram illustrates the 'Service Management Processes (ITIL)'. It features a central circle with the text 'Service Management' and 'ITIL'. Surrounding this central circle are four segments representing the ITIL processes: 'Service Design' (top), 'Service Transition' (right), 'Service Operation' (bottom), and 'Continual Service Improvement' (left). Arrows indicate a clockwise flow between these processes, with an additional arrow pointing from 'Continual Service Improvement' back to 'Service Design'.

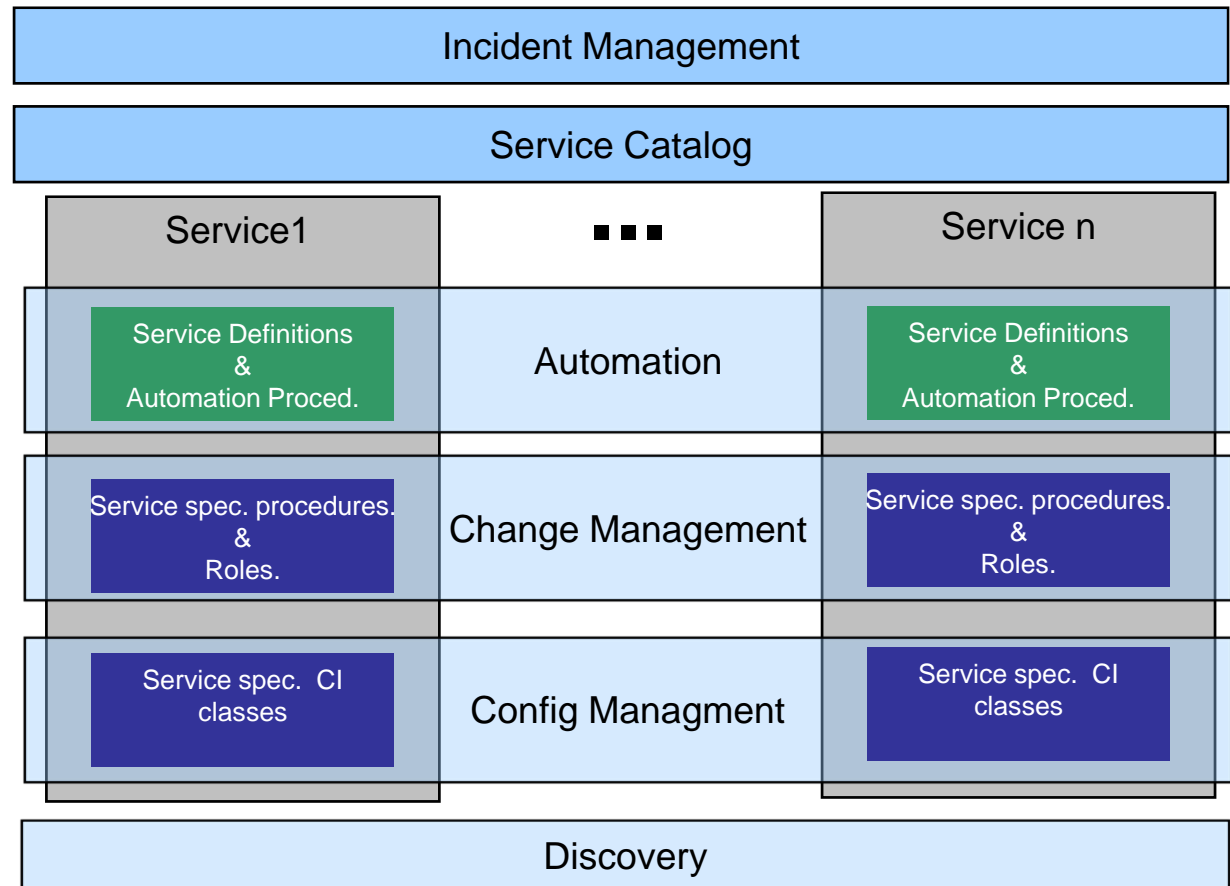
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- The diagram illustrates the relationship between Service Management (TSAM), Task Automation, and Organization and People across a process flow. The process flow is represented by a sequence of steps: a green triangle, followed by seven circles (orange, green, orange, orange, orange, green, green), and a red square. The process is managed by an 'Owner' (represented by a person icon) and an 'Aut. Asset Owner' (represented by a person icon with a wrench).
- The process is divided into three main layers:
- Service Management (TSAM):** This layer contains the 'Process Automation' banner, which spans the entire process flow.
  - Task Automation:** This layer shows the specific tasks associated with each step in the process flow. Tasks are represented by icons: a yellow box with text, a gear, a globe with a checkmark, a yellow box with text, a gear, a globe with a checkmark, and a yellow box with text.
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- The diagram shows how the process flow is managed by the Owner and Aut. Asset Owner, and how the tasks are performed by the Organization and People. The process flow is divided into three main layers: Service Management (TSAM), Task Automation, and Organization and People.

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# The Introduction of Cloud Services



# Integrated Service Management Architecture



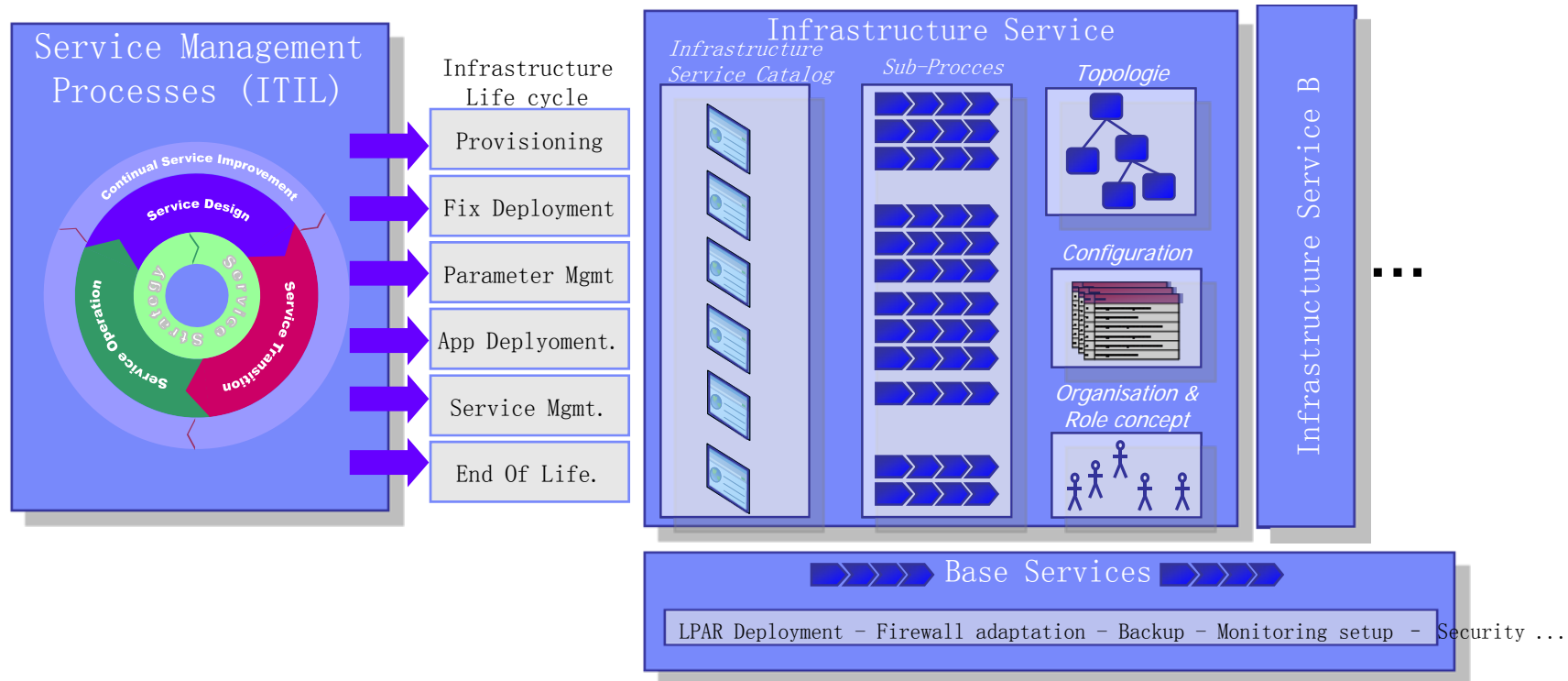
- A Service consists of components for:
  - Automation (optional)
  - Change Mgmt (mandatory)
  - Config Mgmt (mandatory)

- Automation can be added and increased over time

- **Change and config mgmt are mandatory** for automation and provide a framework where the service components can plug-in. They provides overall processes and roles.



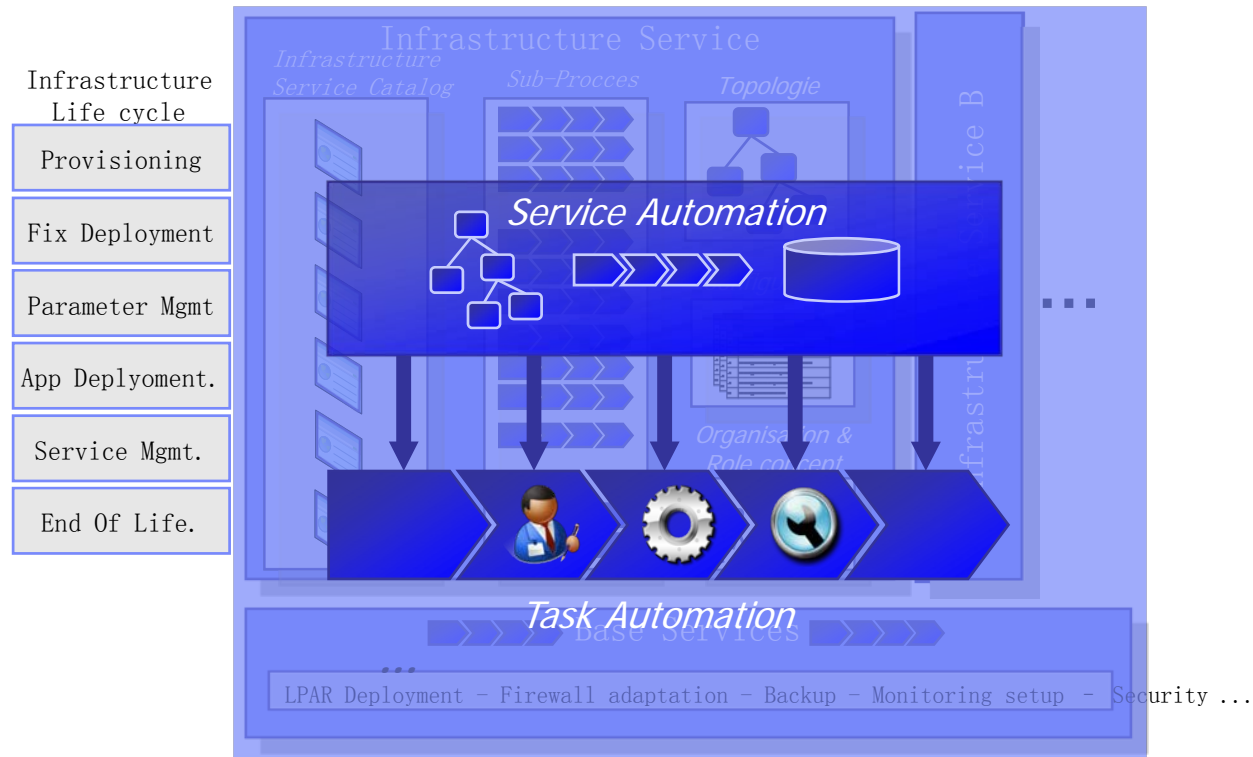
## Infrastructure Service Model defines the Components necessary for Service Design and Service Automation and is integrates into ITIL Processes



### Essential requirements to the Service

- Access thru Service Catalog
- Concept to template a reference architecture (topology)
- Orchestration of people, roles, scripts and tools (automation)
- Integration in configuration DB

## Life Cycle Management of an Infrastructure Services

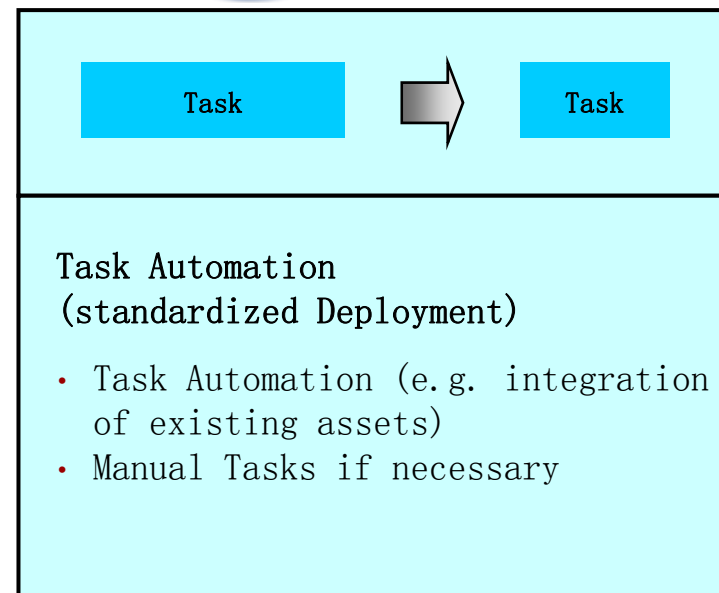
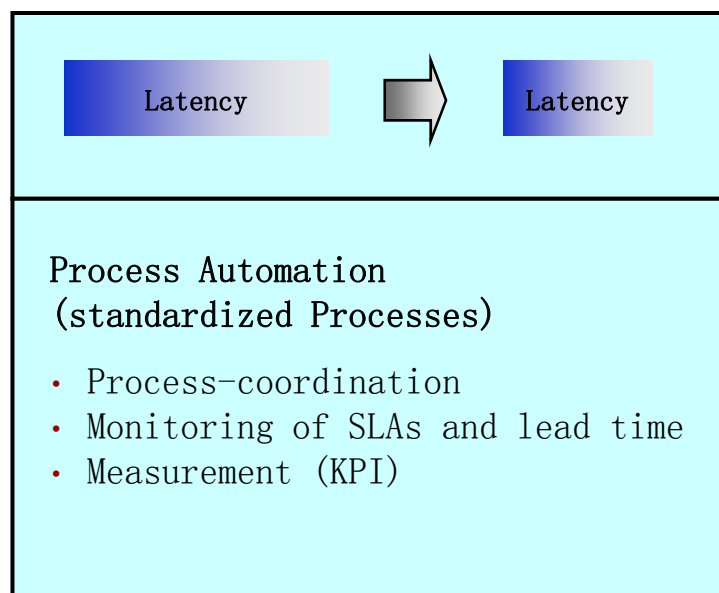


■ Automation of an infrastructure process is automated by a workflow based tool. The flow controls and orchestrates the task and is monitored and measured thru the tool. Hereby some of the tasks can be still executed manually. This kind of automation is called **Process Automation**.

■ **Task Automation** on the other hand is automation the level of tasks. This comprises automation of single tasks via scripts, program code or tools without manual interaction.

■ The most benefit of a service automation project can only be gained if both levels of automation are considered and implemented.

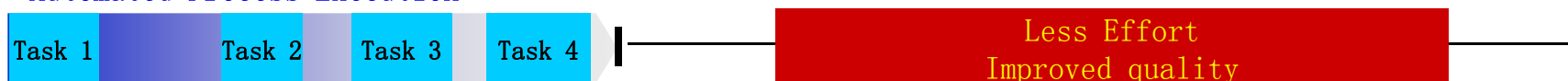
## Service Management improves quality and “time to service”



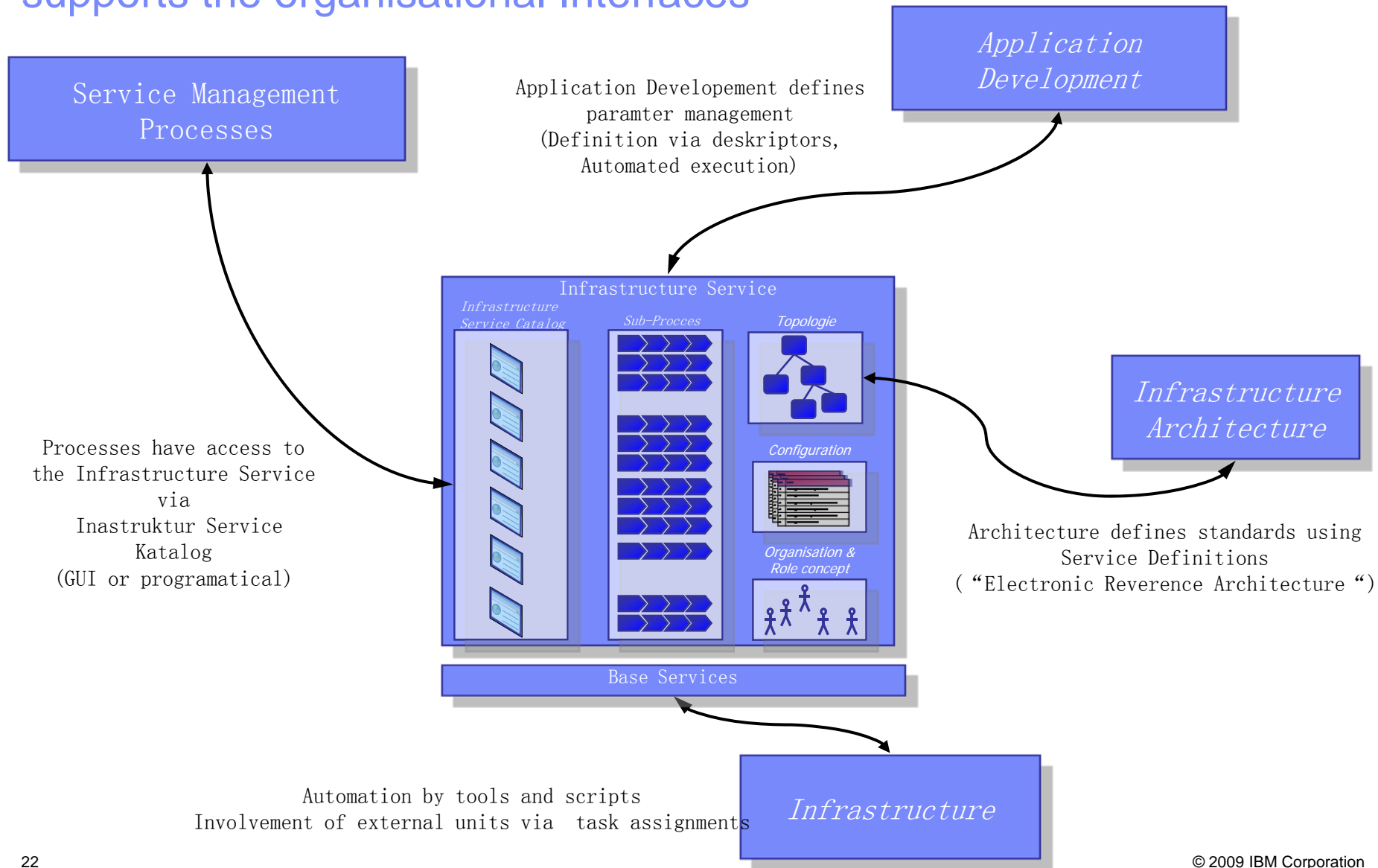
### Process Today



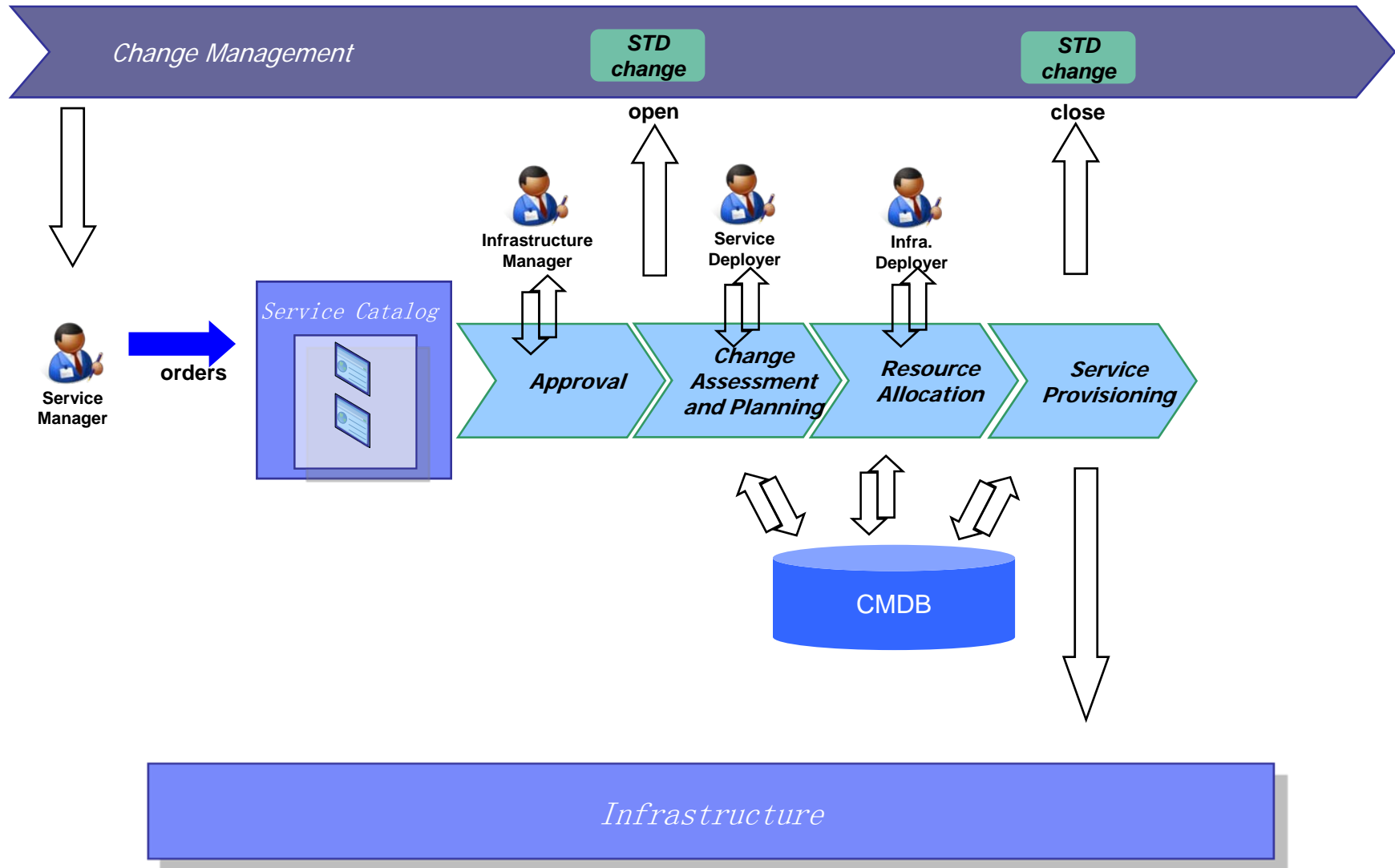
### Automated Process Execution



# Infrastructure Services are integrated into the Organisation and supports the organisational Interfaces



# Change Management and Infrastructure Deployment





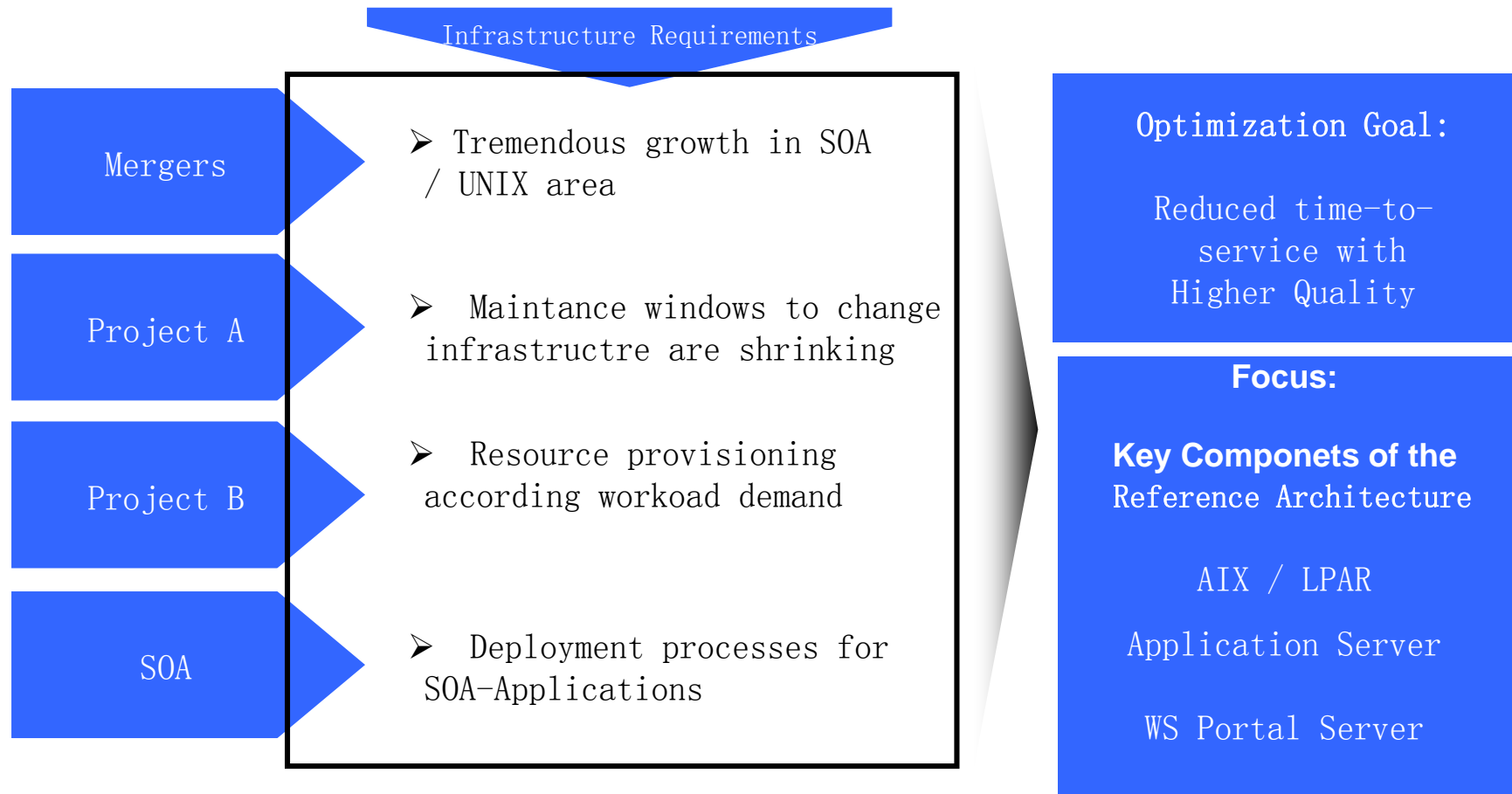
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  - **Customer Example**
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  - Realization of Infrastructure and Cloud Services
  - Standardization of Cloud Services
4. Summary

# Agenda

## Motivation

Varying Needs and Requirements to the Infrastructure creates demand for Standardization and Optimization



## Customer Pain Points – Customer Interview findings

- Standardization of infrastructure service
  - SOA reference architecture exists on application level not on the infrastructure level
  - No infrastructure standards are existing
- Configuration Management
  - CM is done on functional unit/administrator level, mostly done by means of MS Excel
- Service Catalog
  - No catalog or documentation about existing offerings is available. Infrastructure tend to be “One-of-a-kind” solutions
- Process supporting tools
  - There are process tools in place with no value to operation and provisioning departments
- Organization
  - Customer has no well defined concept of roles established, e.g. same task is done in different functional units
- Service management processes
  - Processes for infrastructure deployment are defined (MS Word) but performed environment dependent (e.g. different in test and production).
  - Results are not reproducible (depends on people and skill level)

## Produktionsumgebung mit Zellen & Knoten



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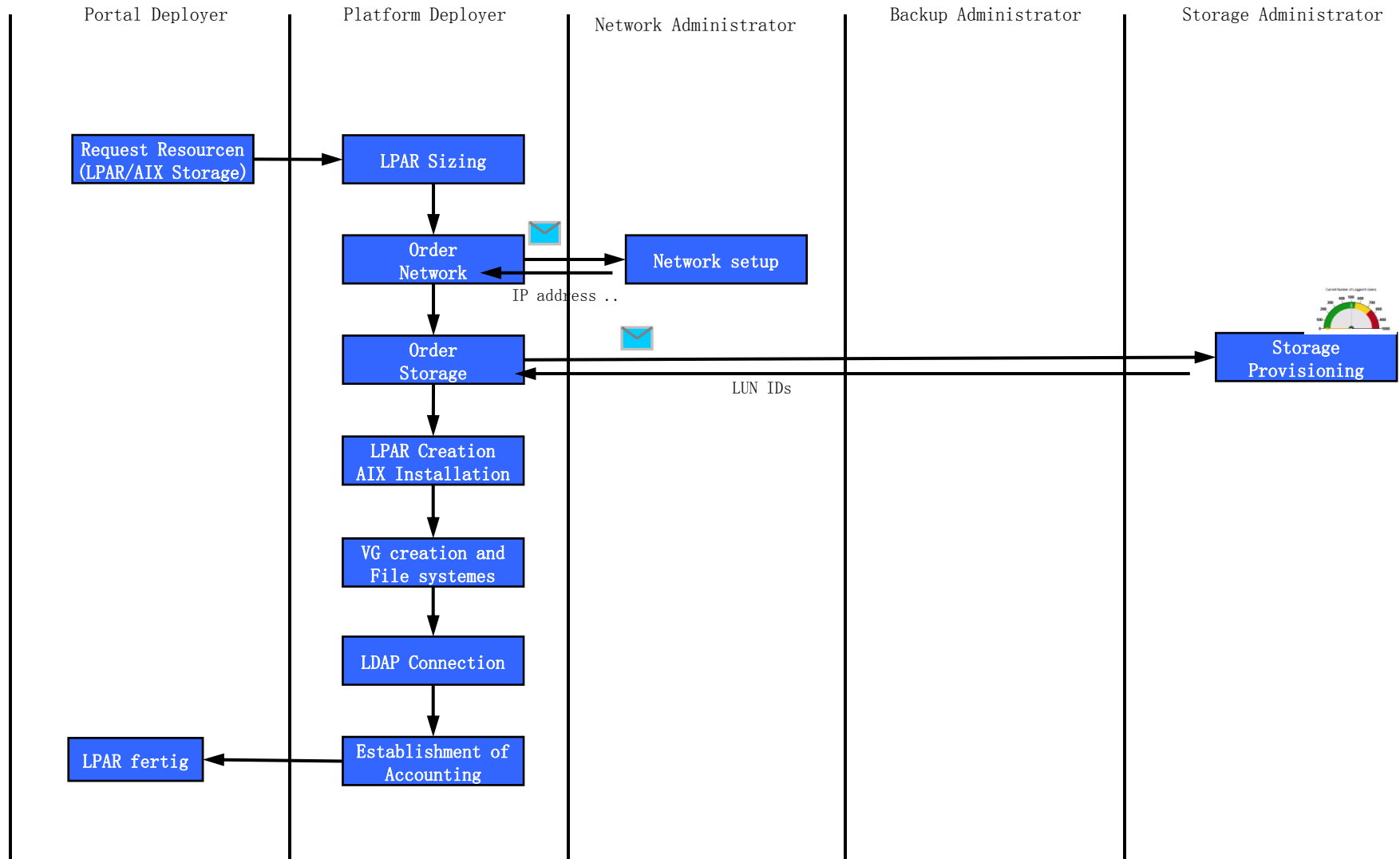
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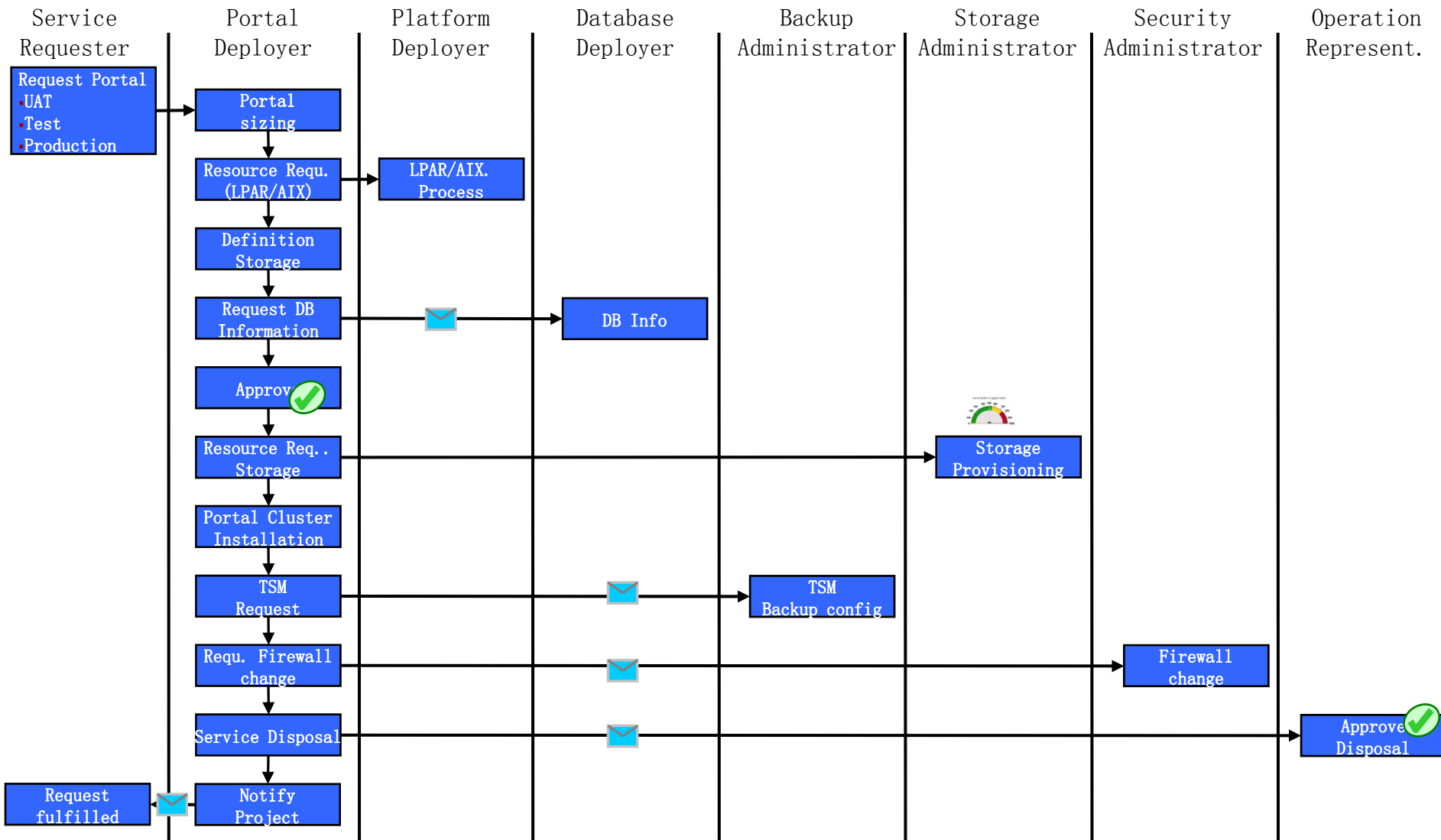
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# AIX LPAR Management Plan



# Portal Provisioning Process



# Agenda

## 1. Introduction

- Problem Area
- IT Infrastructure Library (ITIL)

## 2. IT Service Management – The Heart of Cloud Computing

- ITIL and Cloud Computing
- Customer Example

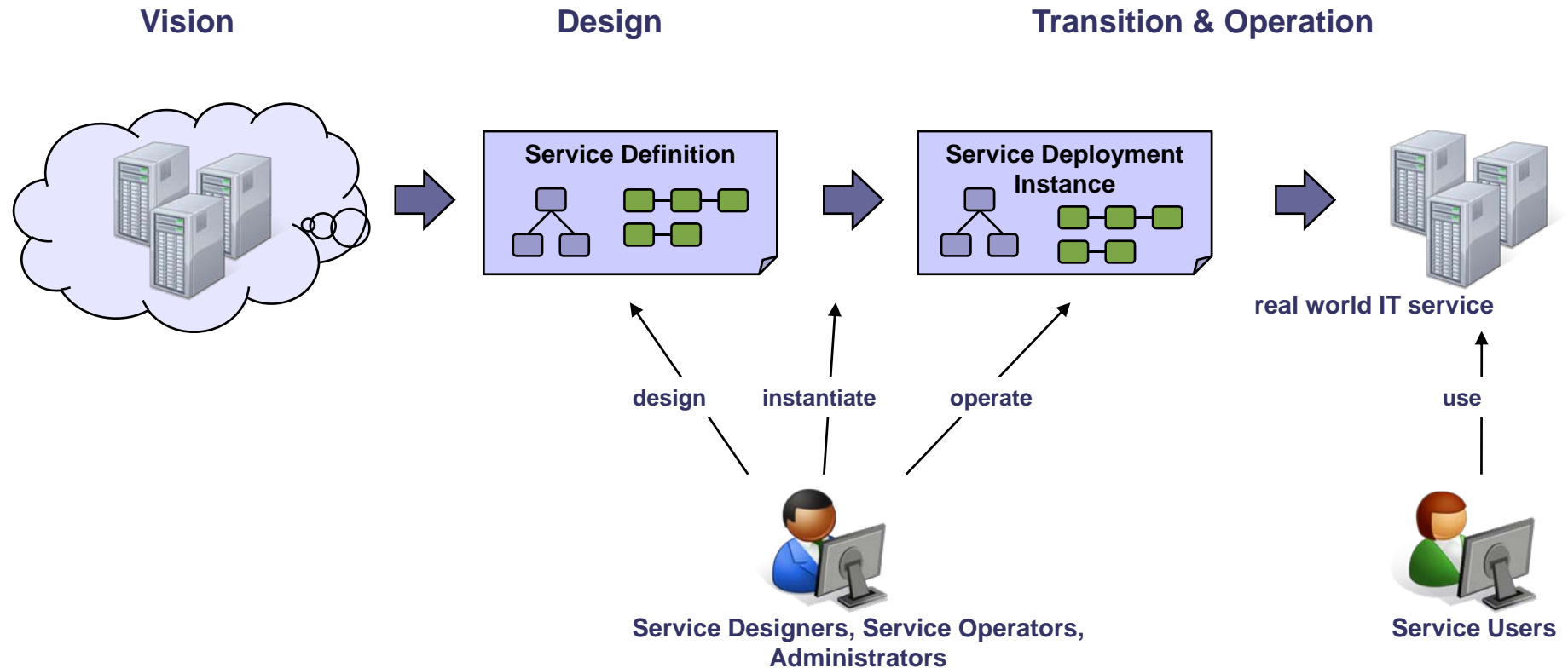
## 3. Tivoli Service Automation Manager Concepts

- Realization of Infrastructure and Cloud Services
- Standardization of Cloud Services

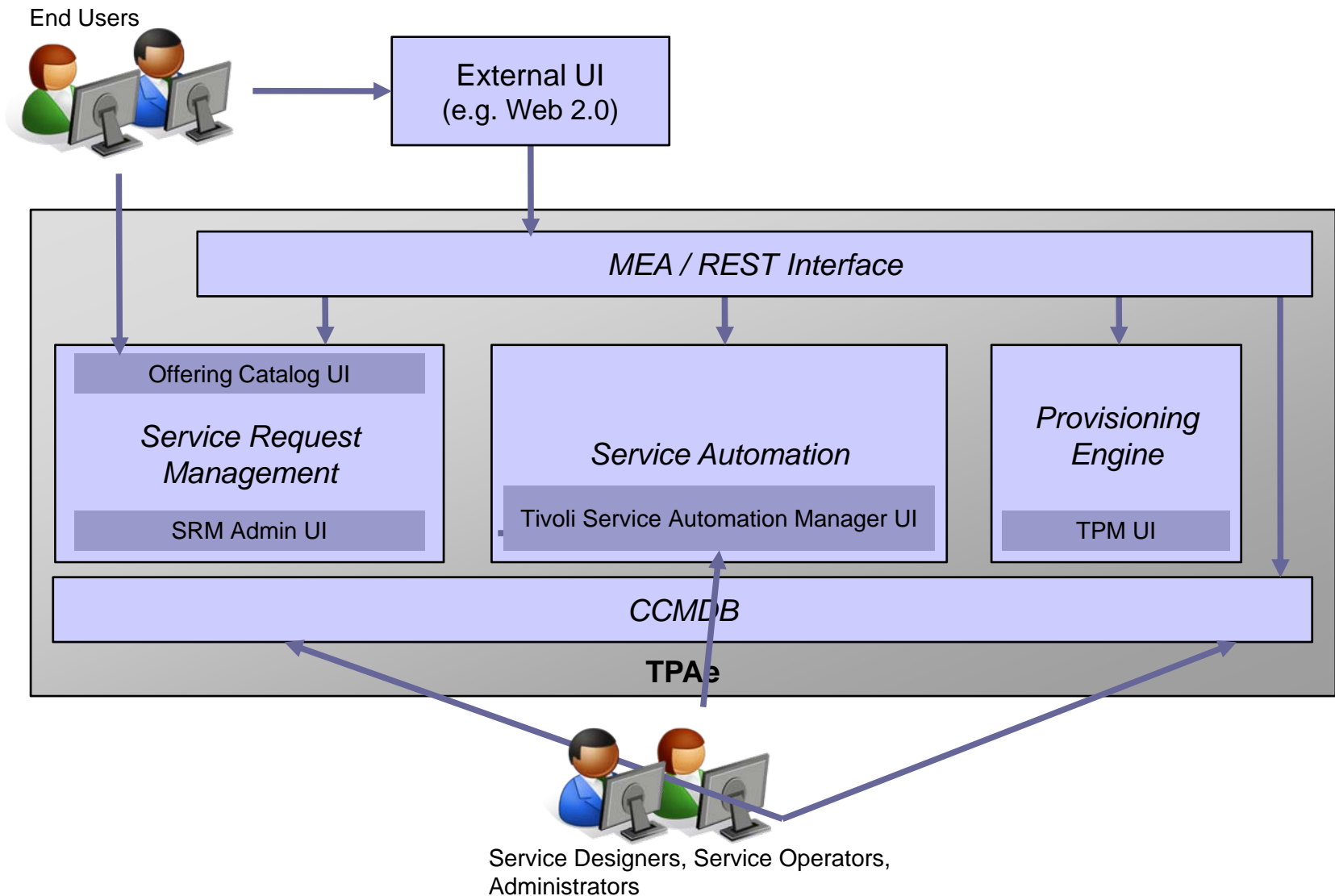
## 4. Summary

# Agenda

# TSAM Model End-to-End View



## Architecture Overview



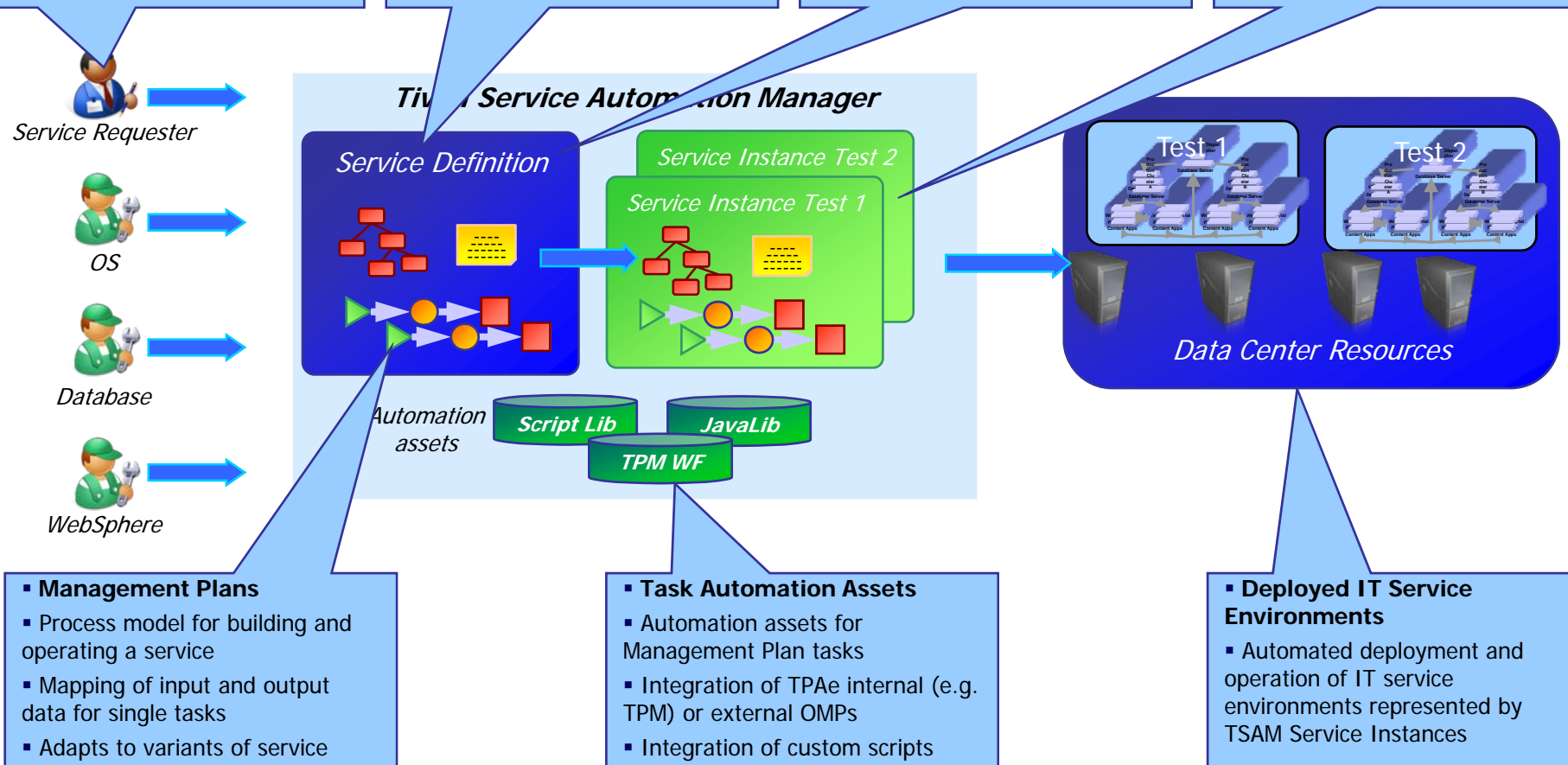
# Tivoli Service Automation Manager Concepts

- **Roles and Responsibilities**
- Open concept of user and roles
- Different views on the service based on roles

- **Service Definition (Template)**
- Open Cardinalities
- Variants
- No assignment of components

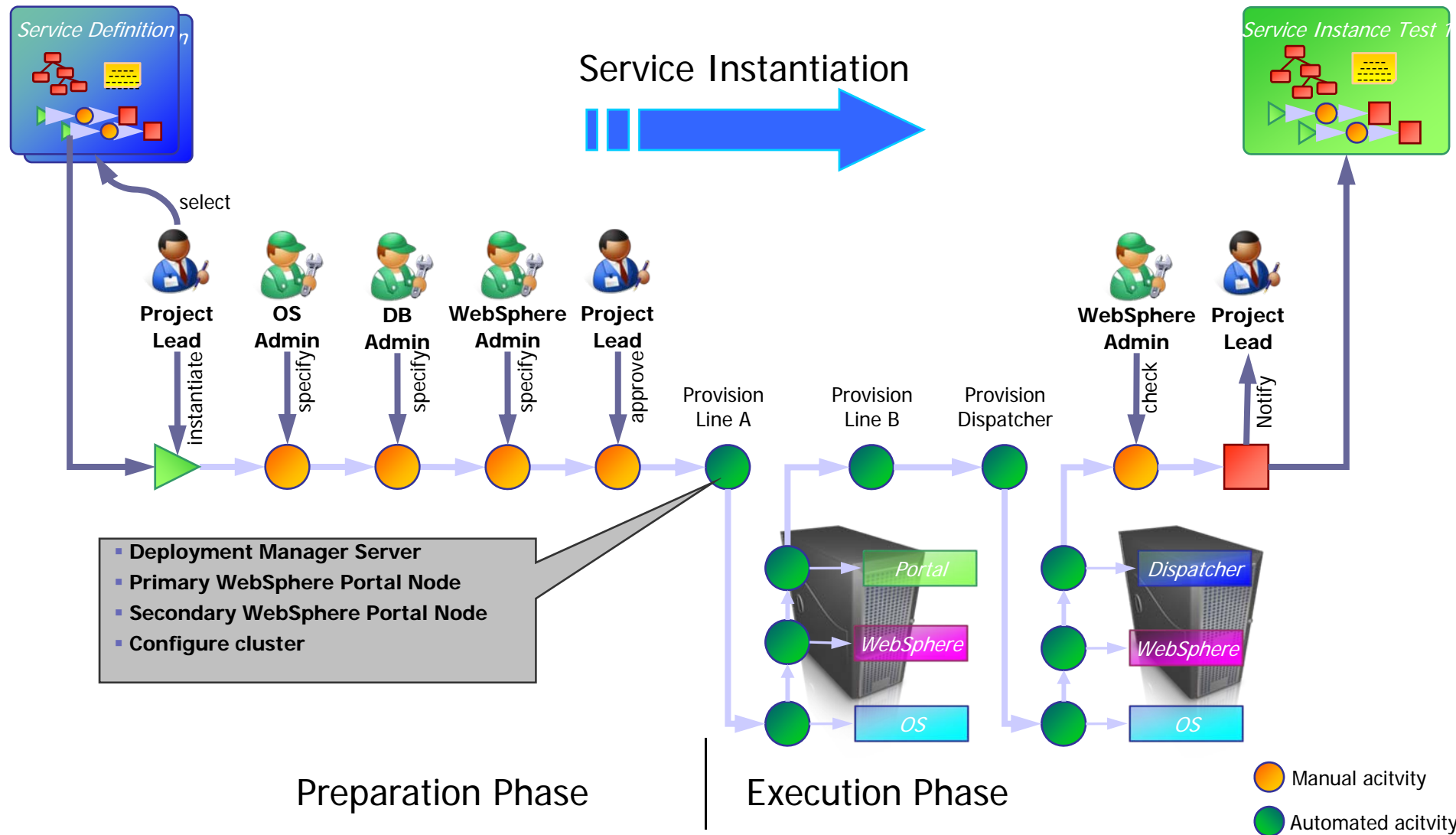
- **Topology**
- Template of best practices
- Topology Node represents one or more IT resources which can be provisioned and managed

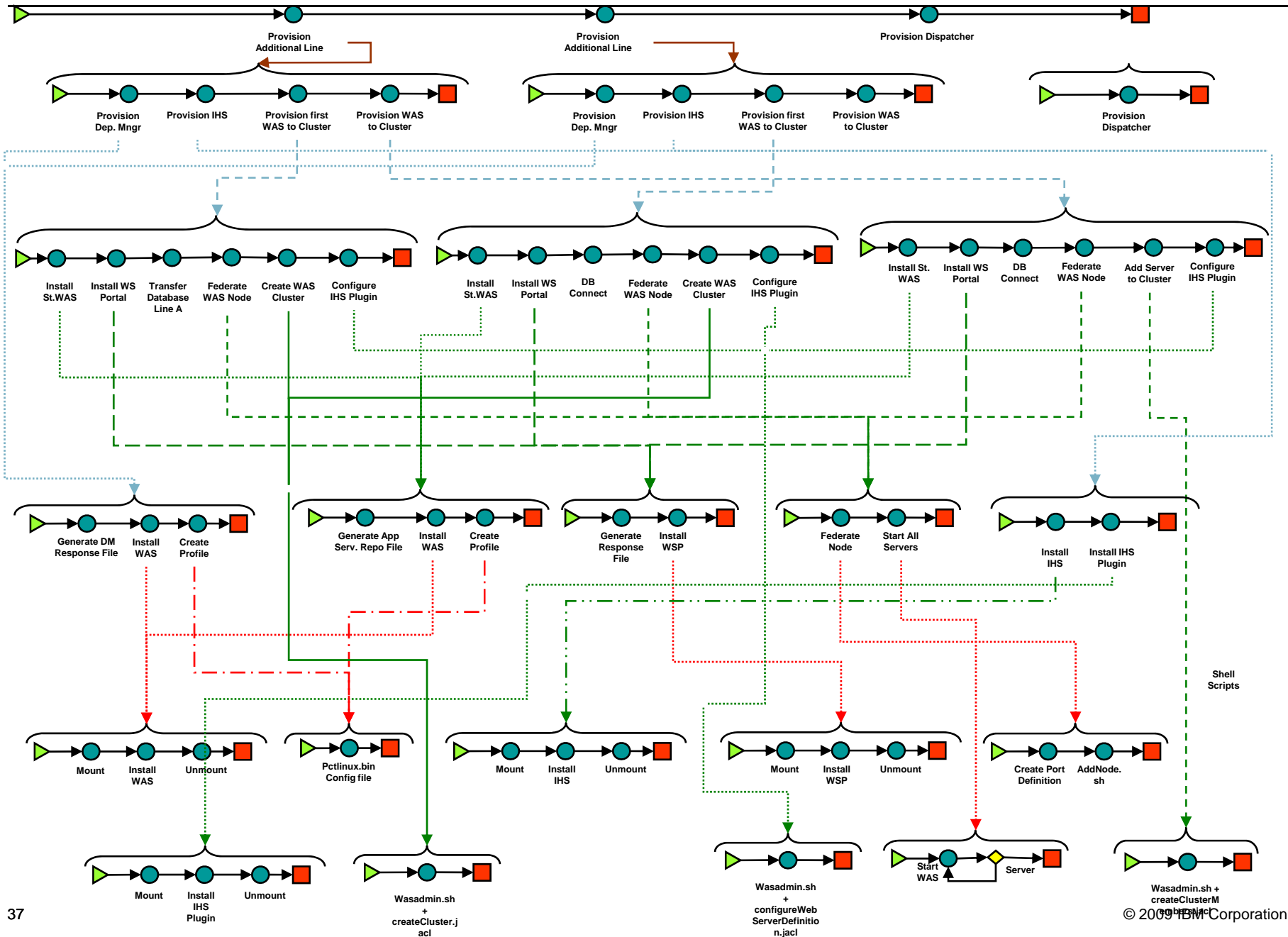
- **Service Instance**
- Represents concrete instance of an IT service
- Instantiated from a Service Definition
- Parameterized and customized



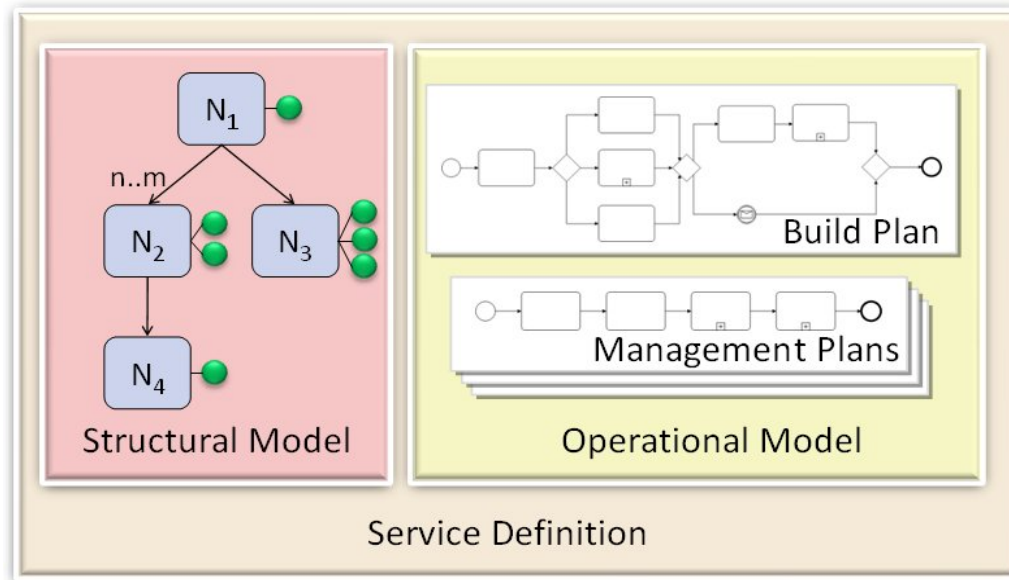


# Portal Cluster Provisioning as an Example of Service Automation



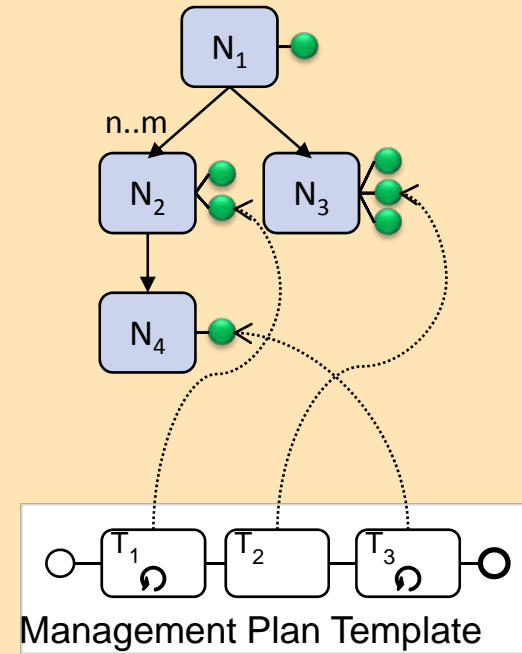


## Service Definition – Full Picture



# Management Plan Template

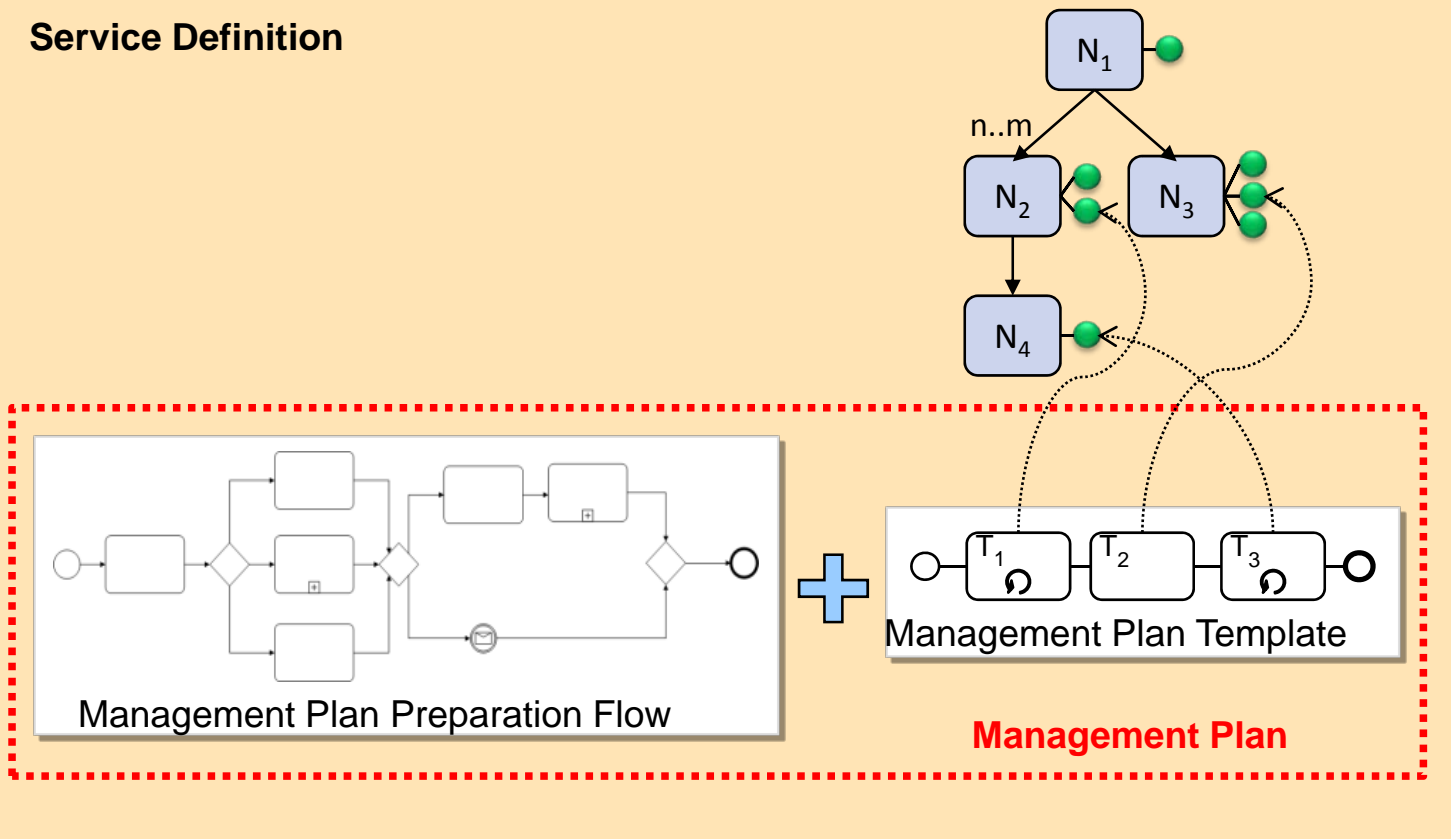
## Service Definition



- Definition of fulfillment task sequences
- Definition of data flow (param. mappings)
- Variability, conditions, ...

# Management Plan Phases

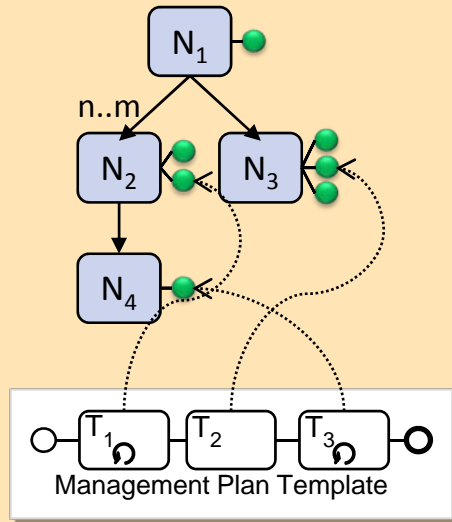
## Service Definition



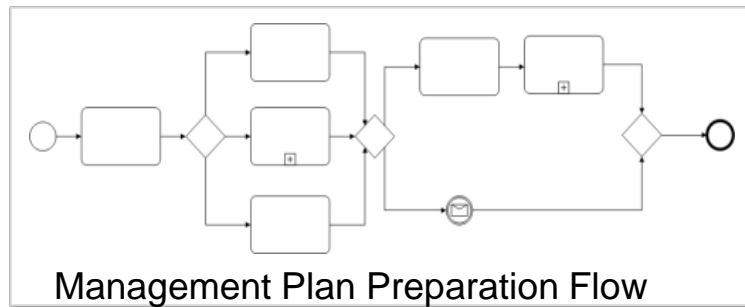
- Collection of required data
- Preparation of topology and data model
- Approvals ...
- Generation of fulfillment flow

- Definition of fulfillment task sequences
- Definition of data flow (param. mappings)
- Variability, conditions, ...

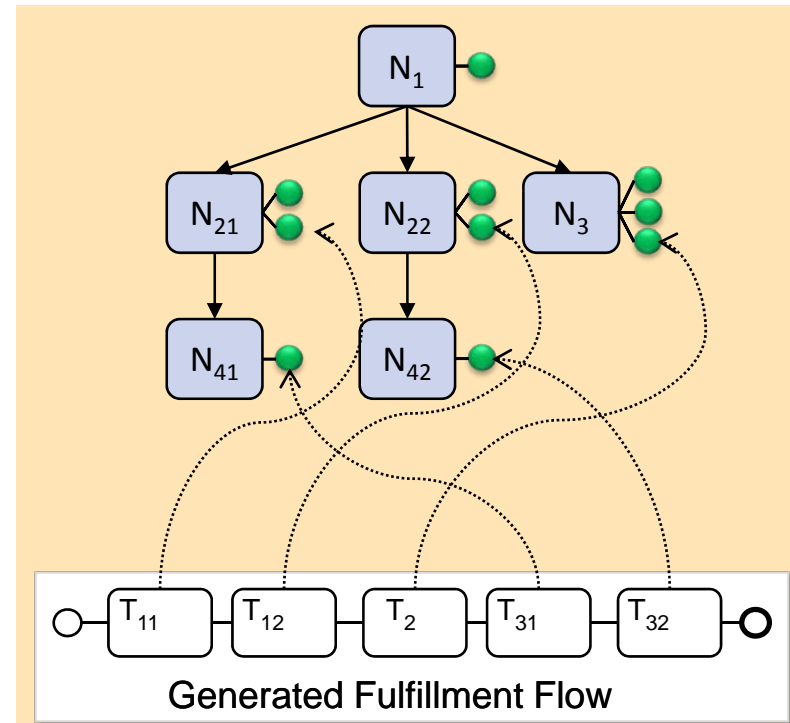
## Management Plan Phases (Runtime)



**Service Definition**



**Management Plan Preparation Flow**

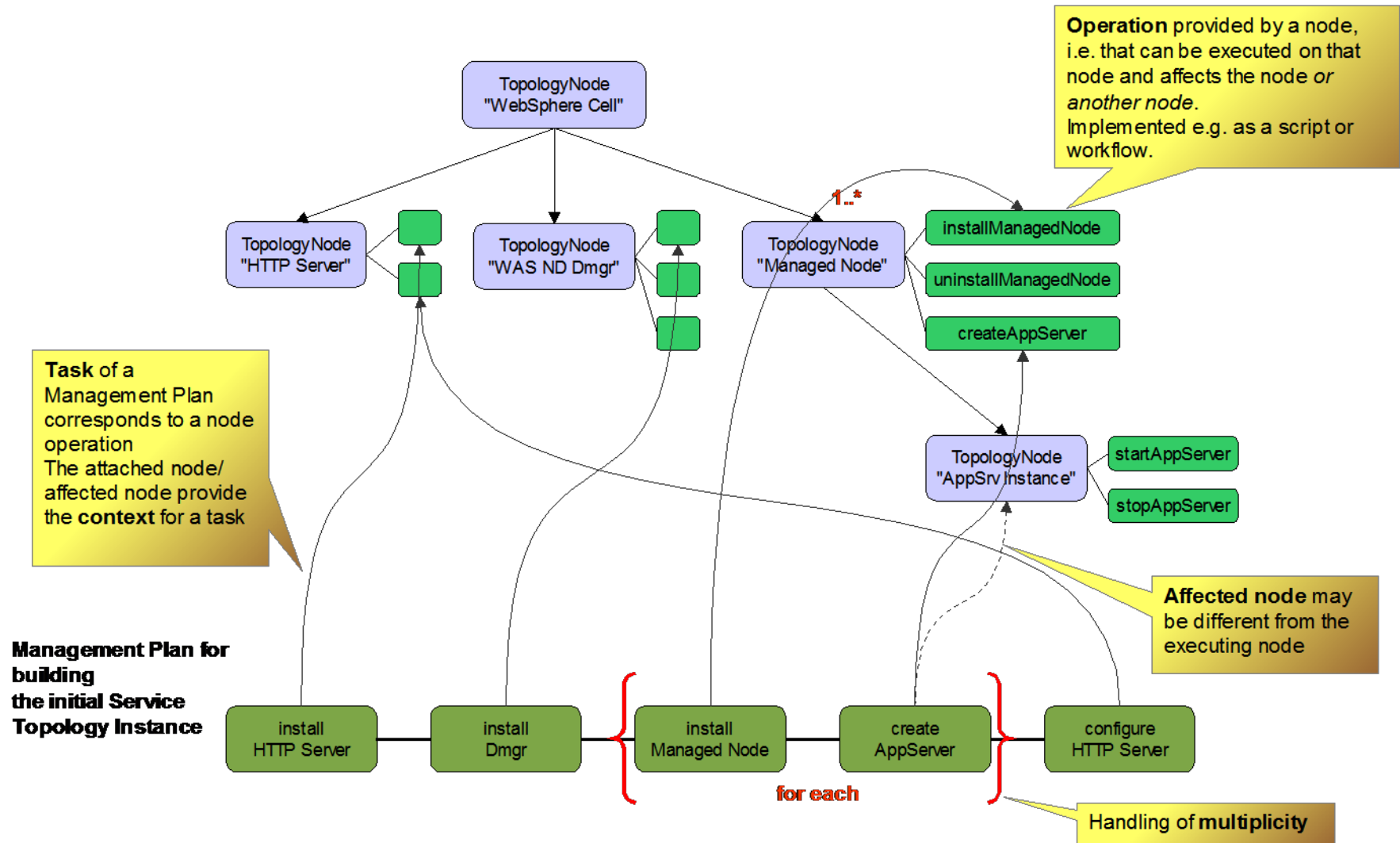


**Generated Fulfillment Flow**

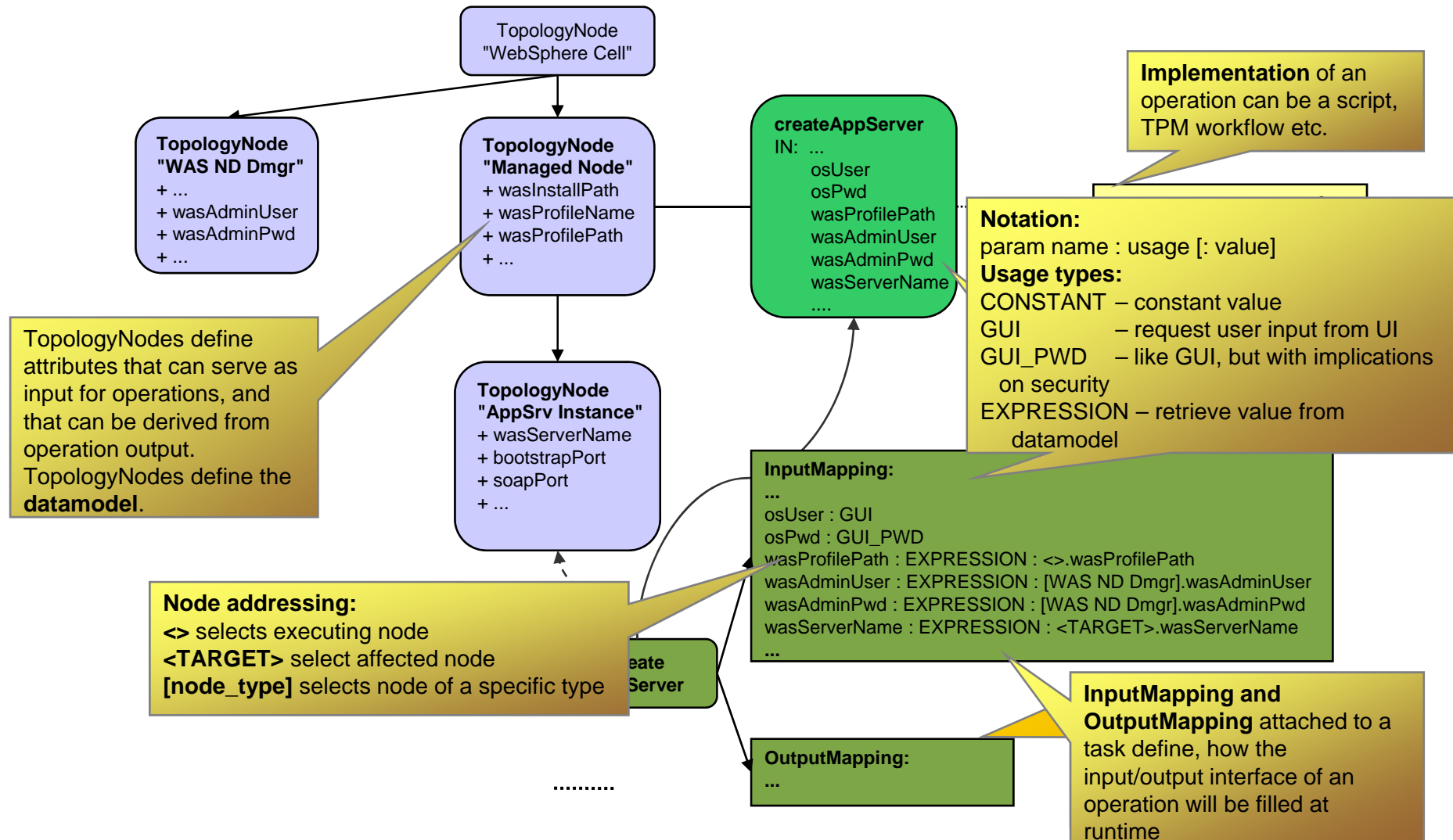
**Service Instance**



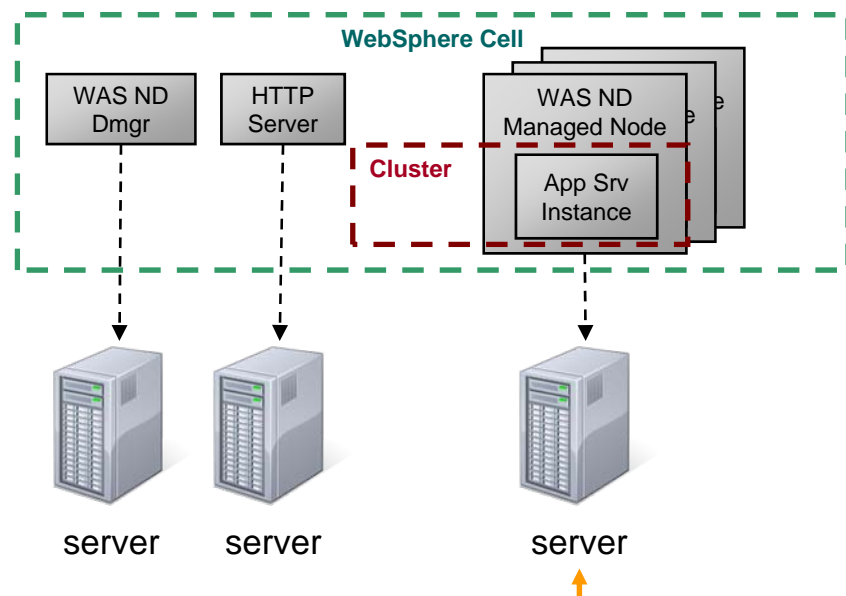
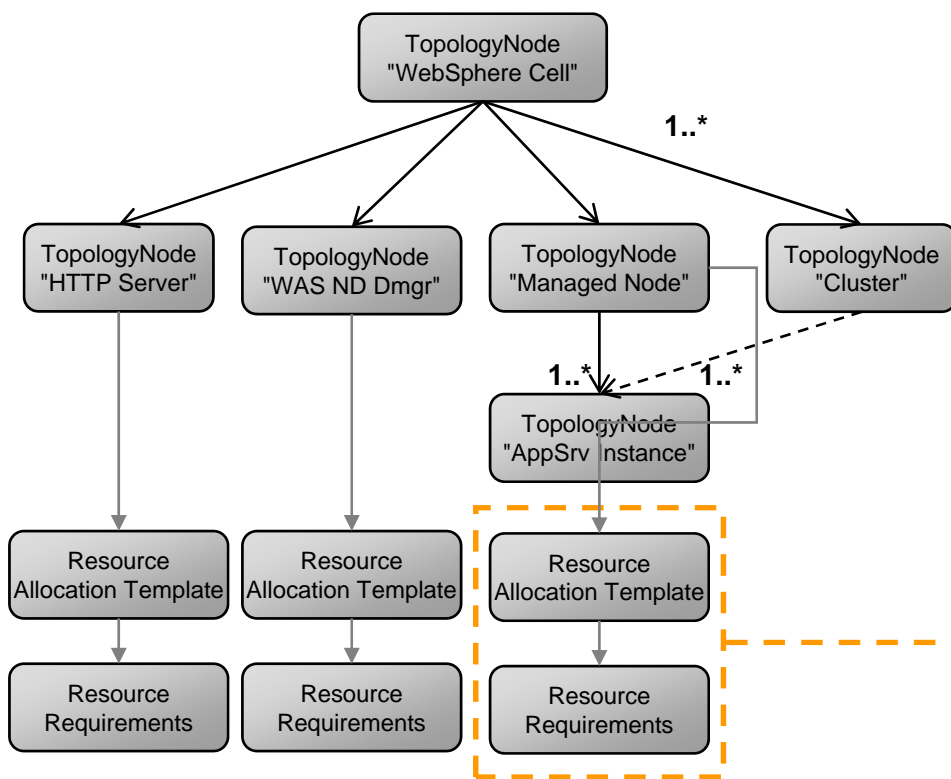
## Example: WebSphere Application Server Service Definition



# Operation Interface and Management Plan Task Parameter Mapping

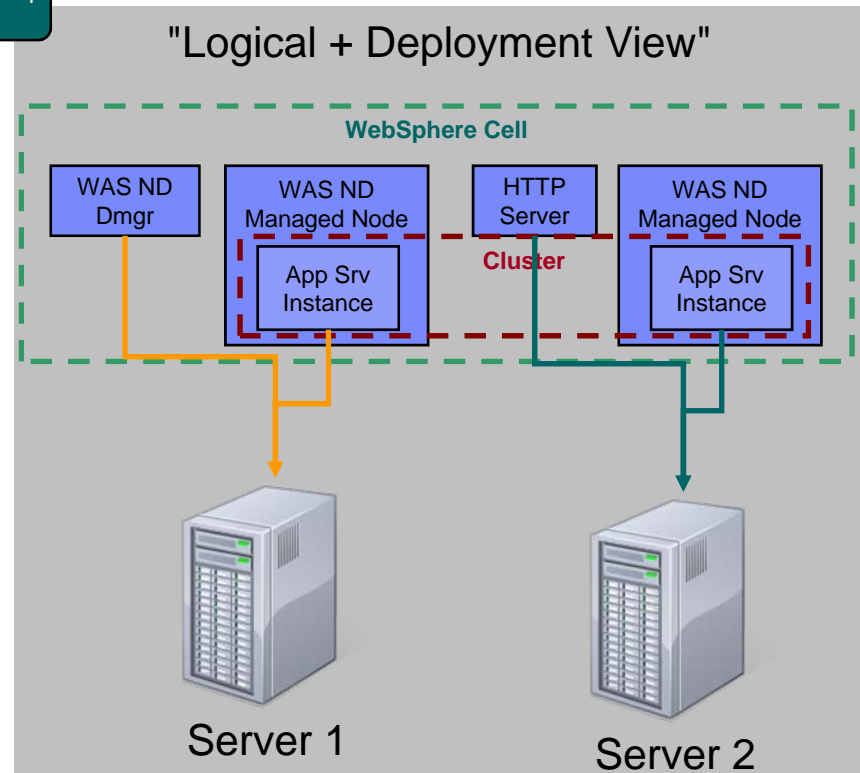
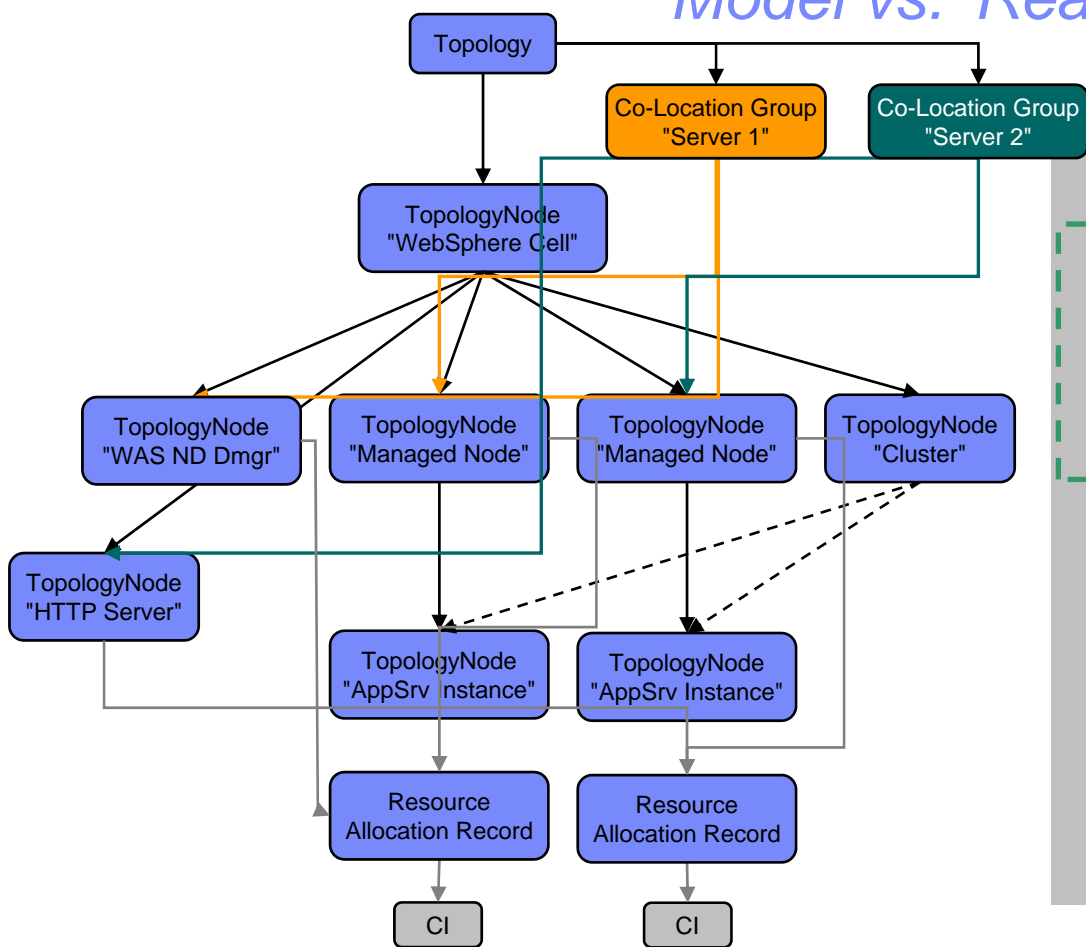


# WebSphere: Service Topology Template and Resource Allocation Templates



# Service Topology Instance

## Model vs. 'Real World'



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  - **Standardization of Cloud Services**
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## Why Service Automation Standards?

- Interoperability of IT Services is a concern of growing importance
- When Cloud Computing gets mainstream, interoperability of IT services is a must
  
- The following scenarios ...
  - Creating a Market For Cloud Applications
  - Mobility of Cloud Applications
  - Interoperable Service Compositions

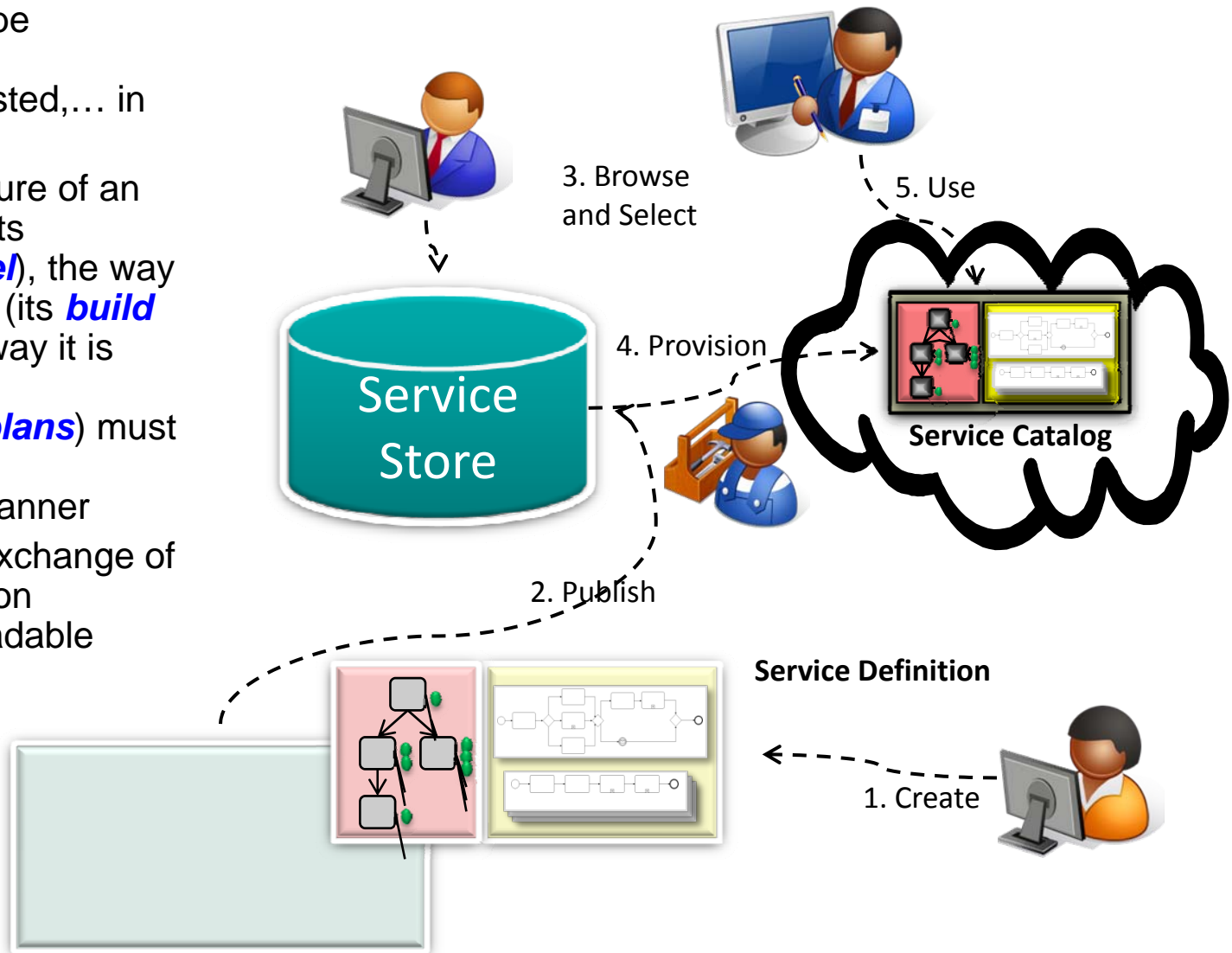
... are underpinning the need for standardization

... are used to motivate standardization areas



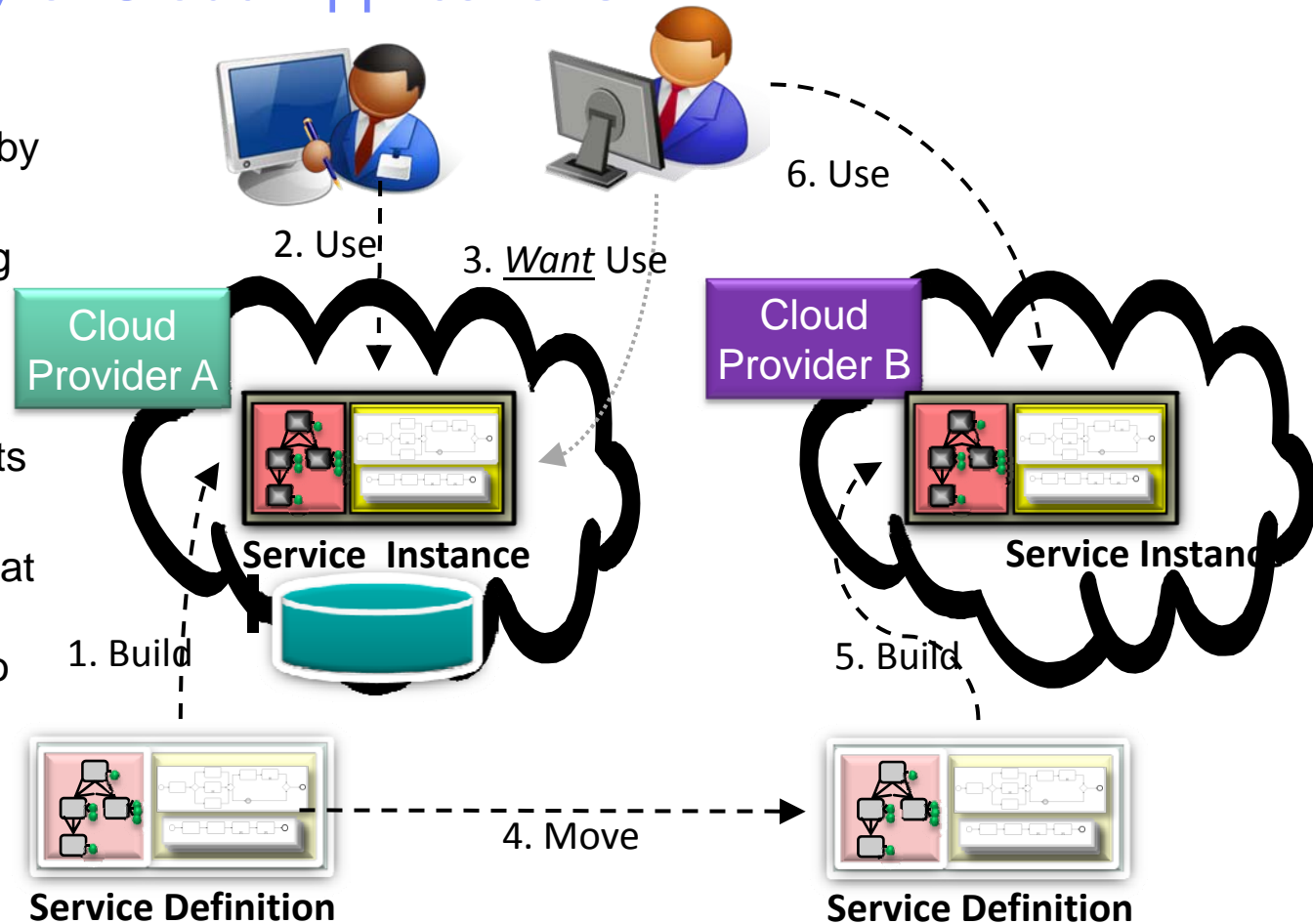
## Scenario: Creating a Market For Cloud Applications

- IT services will be marketed, sold, provisioned, hosted,... in the cloud
- Thus, the structure of an IT Service (i.e. its **topology model**), the way it is instantiated (its **build plan**), and the way it is managed (its **management plans**) must be defined in an interoperable manner
- This will allow exchange of services definition especially as tradable artifacts



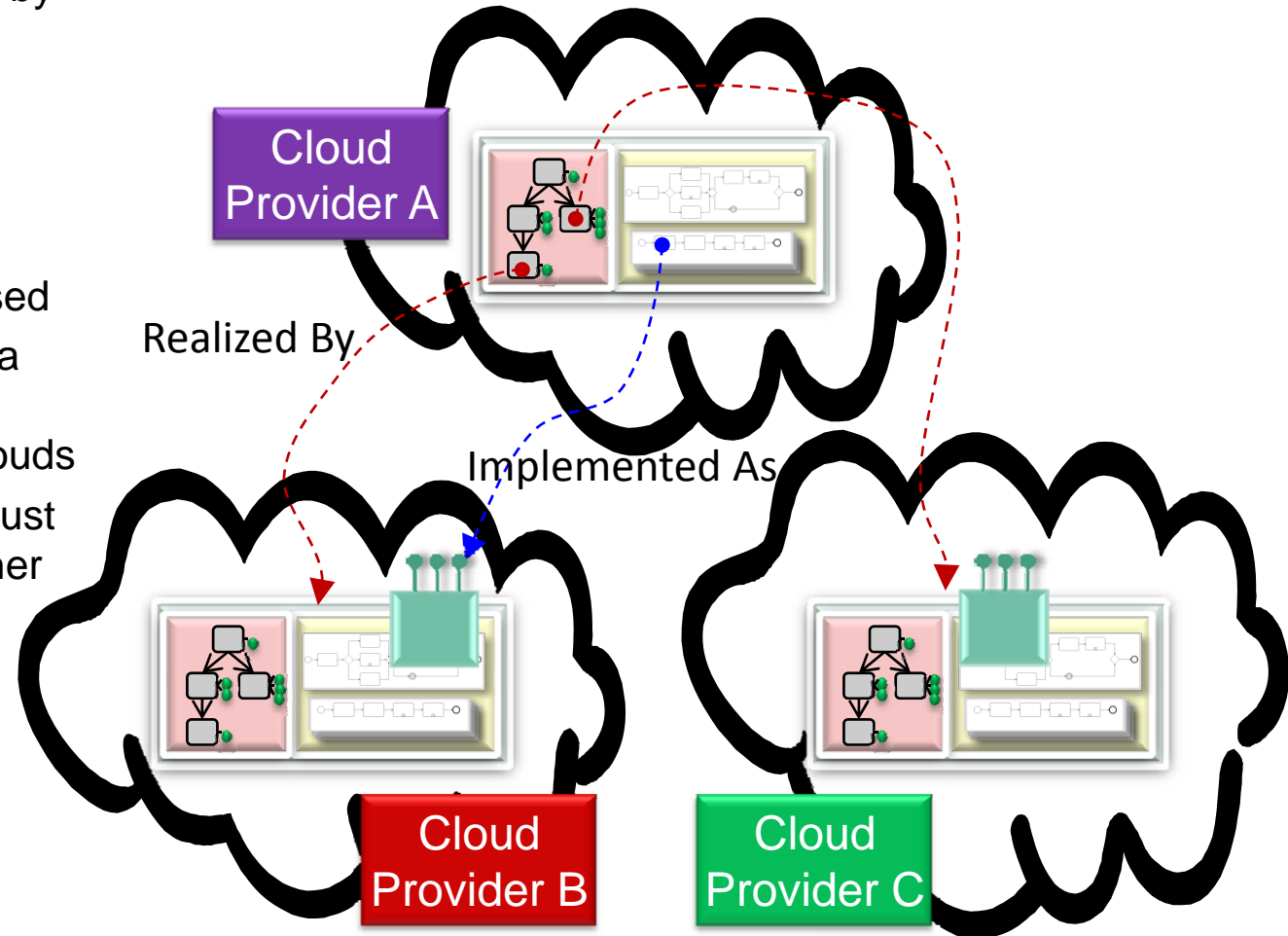
## Scenario: Mobility of Cloud Applications

- Mobility of an IT Service means that its service definition is understood by compliant providers
  - Especially, receiving provider can create and manage corresponding services based on its definition
- This enable providers that don't understand the corresponding service to host it (provision it, manage it,...)



## Scenario: Interoperable Service Compositions

- Services may be composed from other services hosted by other infrastructures
  - In practice, customers have different management environments hosting services to be composed
  - A particular service in a cloud may compose services from other clouds
- Thus, service definitions must be able to refer to each other at different granularities



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## Summary

- The “Cloud Computing Hype” drives and supports automation and service orientation in traditional data centers
- In large enterprises Cloud Computing must be linked to processes
- ITIL processes must be cloud enabled
- Highly efficient IT Service Management is essential for Cloud Computing



**For more information, please visit:**  
[ibm.com/cloud](http://ibm.com/cloud)



# TSAM unifies Cloud Computing and Service Management

