



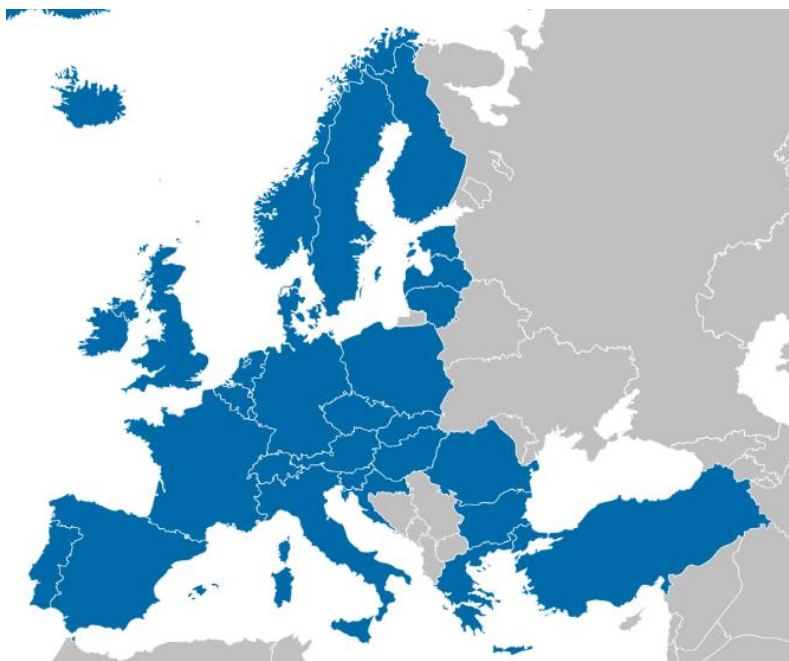
Service Assurance for Space Ground Segments

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- What is EUMETSAT?
- What is a Service?
- Ground Segment as a Service
- Service Processes
- SLA and KPIs
- Service Evolutions
- Built-in Quality
- Take Home Message

- EUMETSAT is the European operational satellite agency for monitoring weather, climate and the environment.
- Intergovernmental organization, founded in 1986.
- 30 member states.



- 4 GEO satellites (3 MSG & 1 MTG)



- 6 LEO satellites (2 Metop, 2 S3, 1 S6, 1 Jason)



More info in: www.eumetsat.int



What is a service?

- A service is a means of delivering value to customers by facilitating outcomes customers want to achieve, without the ownership of specific costs or risks (ITIL)
- Services have a development and operation phase.
- The development phase has typically several cycles (Iterations) until the service is fully deployed.
- The operation phase is sustained during a period of time and starts as soon as the Minimum Viable Service is deployed.
- Services have a generic layer that defines the service characteristics (similarly to requirements and ICDs) which encapsulates the service implementation (system layer).
- Examples of services:
 - IT Cloud, IaaS, PaaS
 - WAN / internet connections

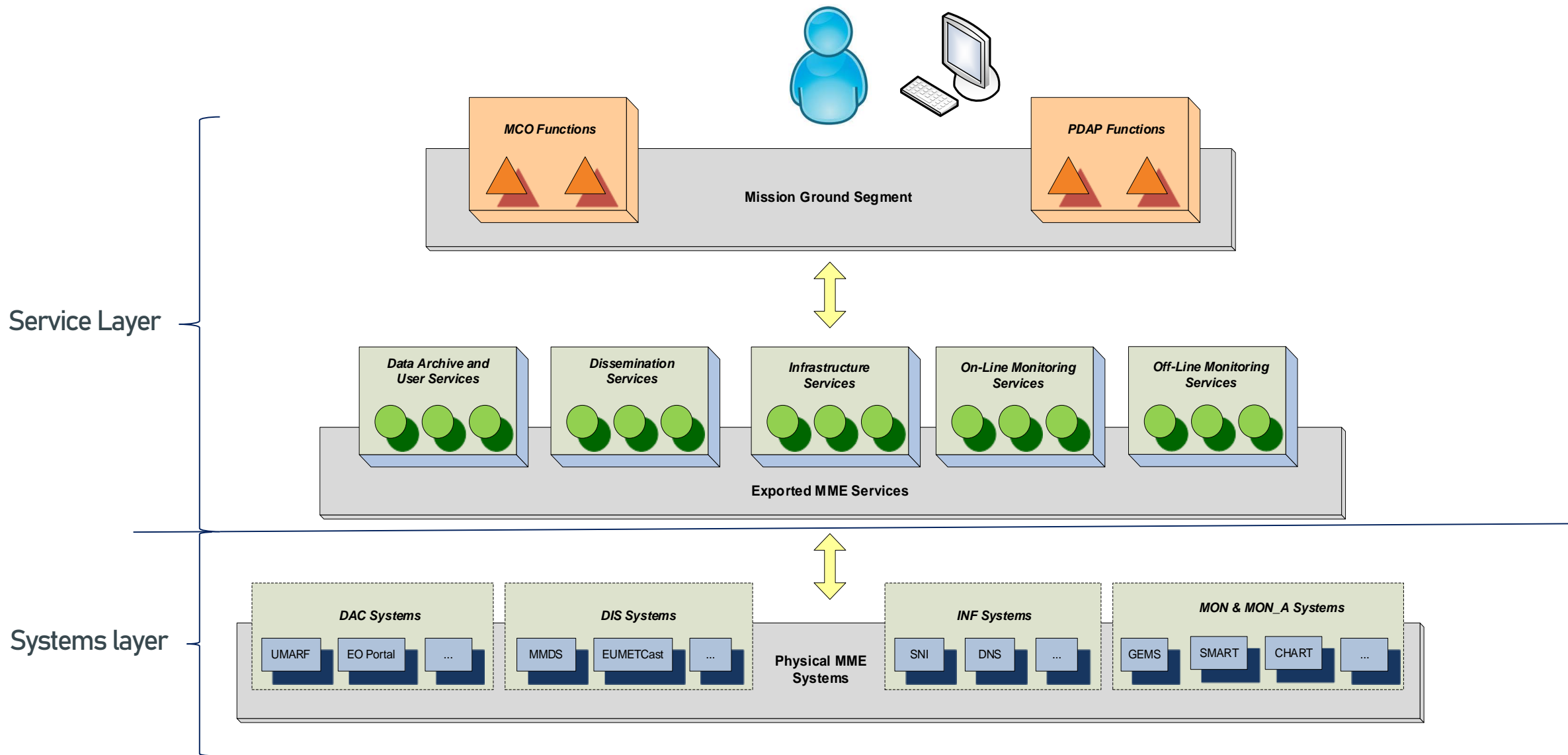


We do not look in detail how the service provider implements the service!

EUMETSAT can be seen as an organisation providing climate and met services



Ground segment as a service





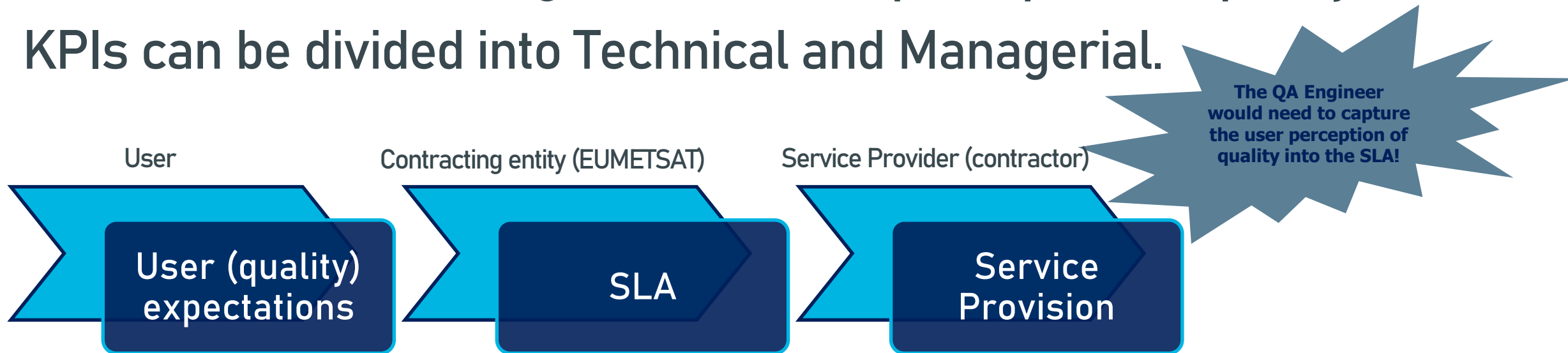
Service development and evolutions

- When a new service is developed or an evolution of a service is required, the development is planned following engineering processes but in an incremental approach. A requirements backlog is created and requirements are allocated to increments. An overall service design review is also important, with delta design reviews as needed as part of the increment acceptance process.
- For new services, increments are defined to provide an operational version as soon as possible with a minimum functionality: The Minimum Viable Service (MVS).
- For services already existing, increments are providing additional functionality while the operational and management processes are already performed.



If we do not look on how the service is implemented, how can we guarantee the quality of the service?

- Service providers ensure a specific level of quality through the Service Level Agreement or SLA.
- The SLA contains a set of Key Performance Indicators (KPIs) which are summarising the customer perception of quality.
- KPIs can be divided into Technical and Managerial.





- Performance KPI:
 - Example: The user shall be able to download the first byte of data in less than 1 s.
- Capacity KPI:
 - Example: The system shall allow the minimum of 500 users to download data concurrently.
- Availability KPI:
 - Example: The system shall be accessible by the users a 99.5% of the time averaged in one month, including planned maintenance downtime.

KPI might seem requirements but need to be measured during the operational phase

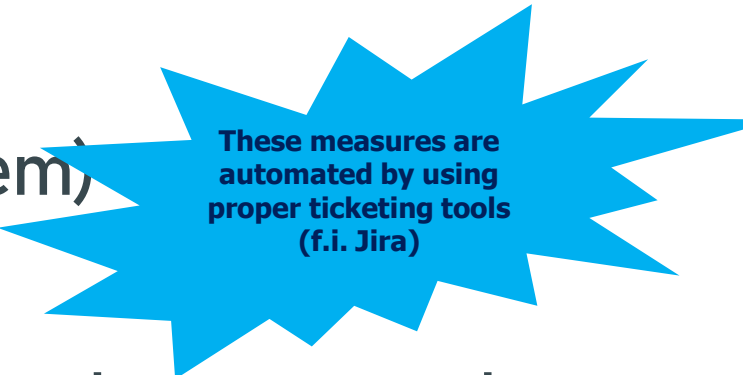


How Technically KPIs are measured and implemented is complex and not the same, some require continuous monitoring, some require sample testing, some require to measure each operation.

All KPIs shall be considered (tested) at service design&development time and periodically measured and reported during the service operation



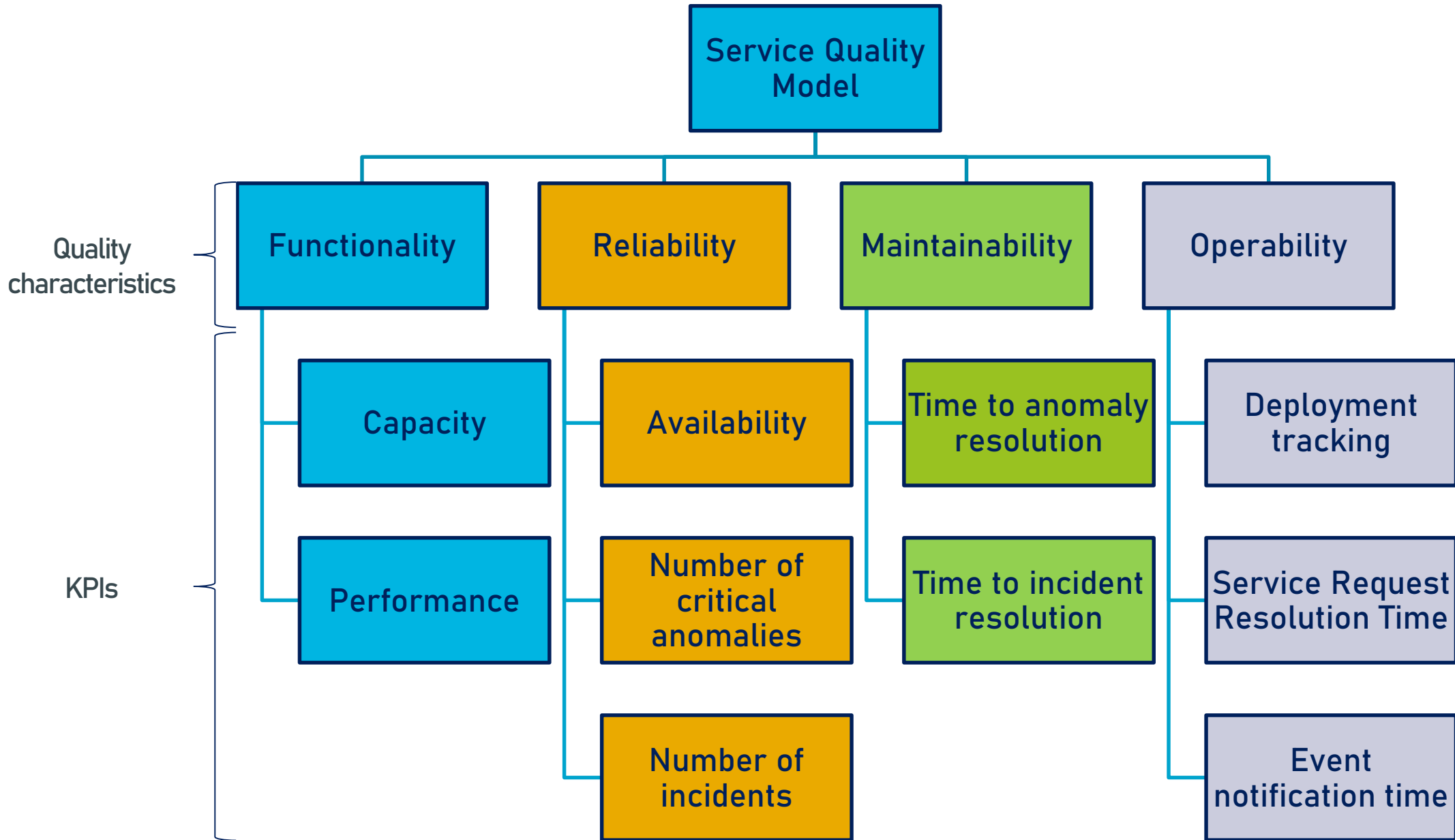
- **Action Resolution Time KPI**
 - Example: Accumulated delay in resolving managerial actions
- **Incident Management**
 - Example: Time to resolve an incident (recover operations)
- **Service Problem Management**
 - Example: Time to resolve a problem (fix the problem)
- **Service Request Management**
 - Example: Time to resolve a service request, f.i. changing a user role, resolving a question, etc.



These measures are automated by using proper ticketing tools (f.i. Jira)



Service quality model example



- To speed up the time to reach users for the new services and service evolutions, applying “Built-in Quality” is a must.
- Built-in quality shifts to the left problems discovery, avoiding the effect of **“I wait for you at the barrier”**.
- Real-time information exchange is a requisite, using tools that allow the definition of workflows and sharing information between the stakeholders, customers and development teams.
- Defining workflows allow the teams to use Kanban boards to control the status of the work (requirements, test, anomalies, etc.).
- Workflows allow as well the definition of pre-requisites for status transition, for instance the set-up of a “definition of done” to transition a requirement to “closed”.

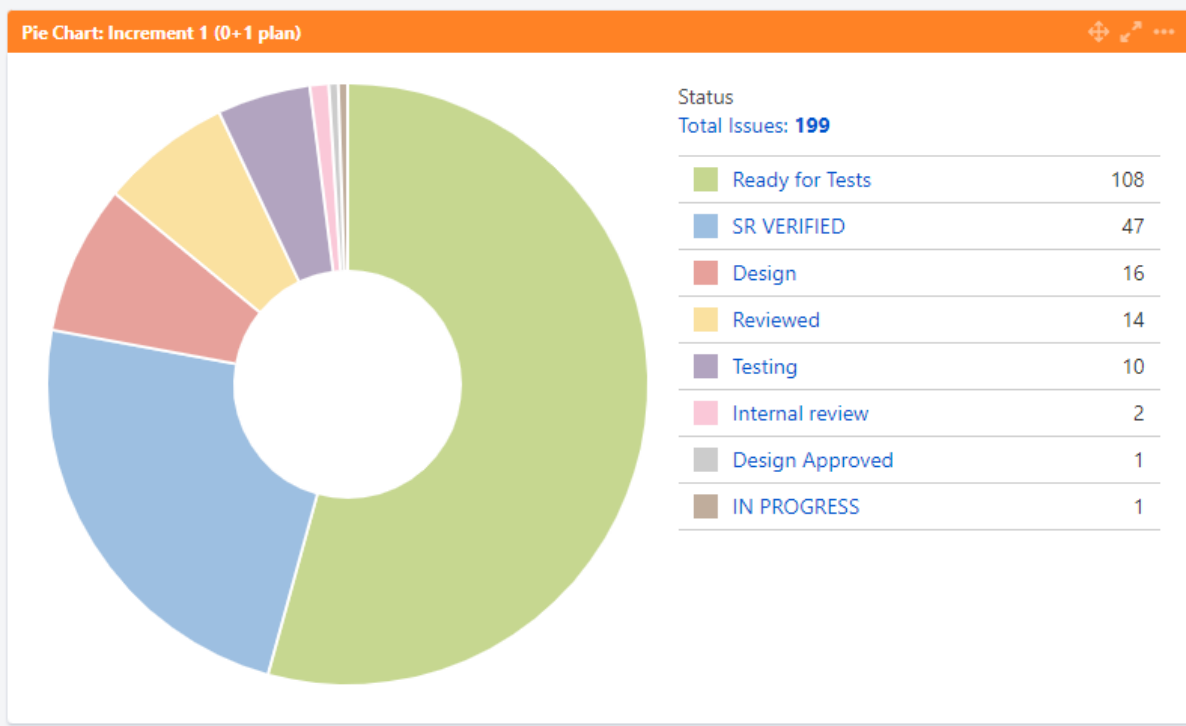




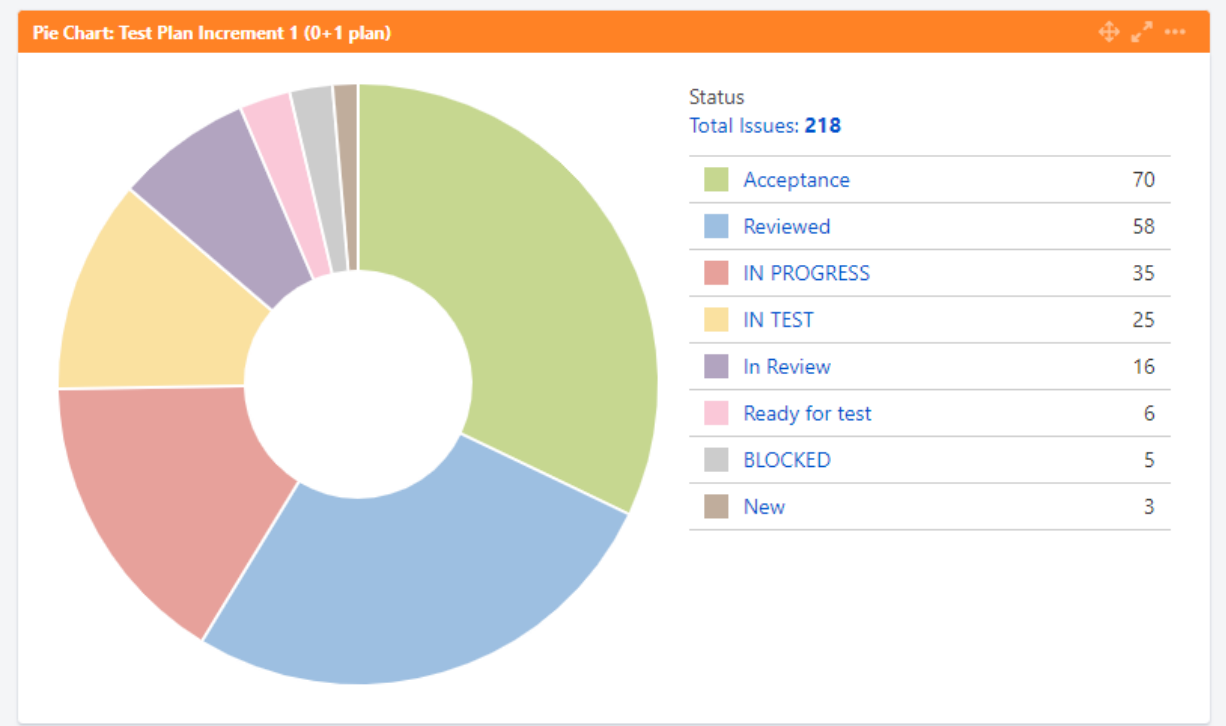
Requirements and tests workflow example

Status of requirements for one increment delivery monitored in real-time

Requirements



Tests





Take home message

KPIs associated to penalties receive a lot of attention by the service providers (contractors) forcing them to self-organising in order to fulfil the targets but without imposing rigid requirements on the “how”

Service development and evolutions should incorporate the built-in quality and shift-to-left approaches to reach users as soon as possible and remove push-back effects

Wrongly defined KPIs will be useless, a waste of time and will not provide any leverage on the quality of the service.



The Service approach, opposite to the regular system engineering approach, is removing the “hands-on” intervention while keeping a balanced control on the quality of the service provision (if KPIs are well defined!)



Thank you!
Questions are welcome.