

Supporting
European
Aviation



“Get into SWIM” session

Non Functional Requirements

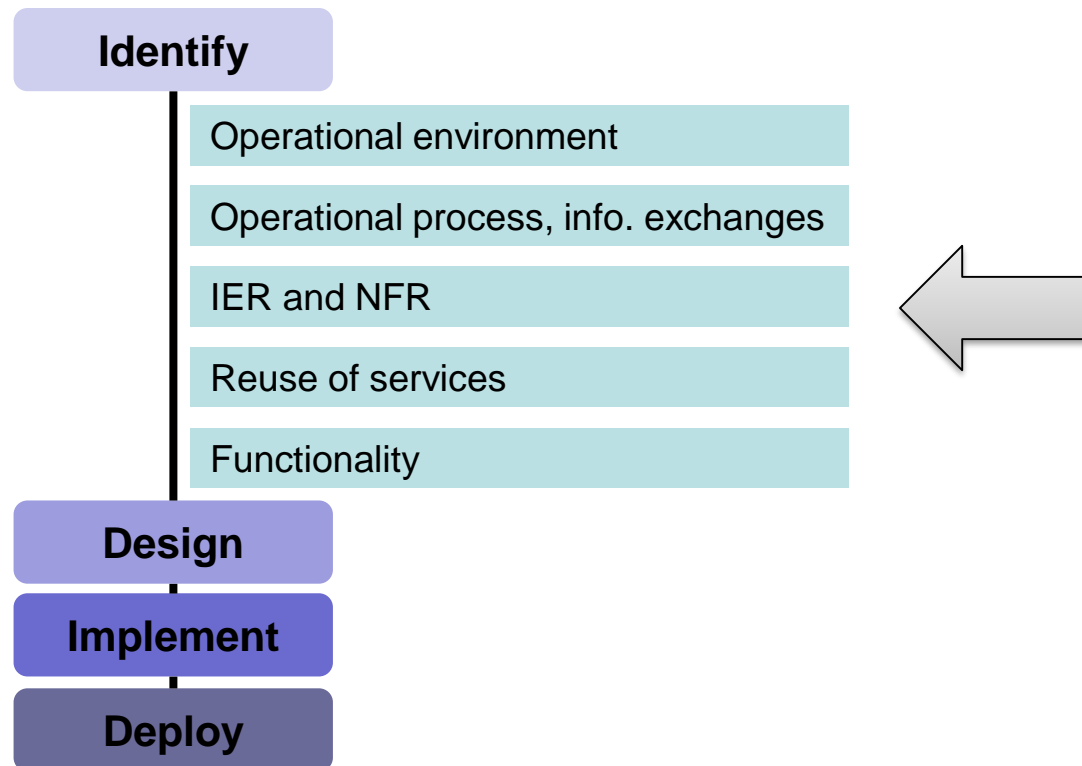
Pedro Fernandez

DECMA / RTD / DAI - Digitalisation and Information unit

22nd May 2019



Non Functional Requirements



Introduction

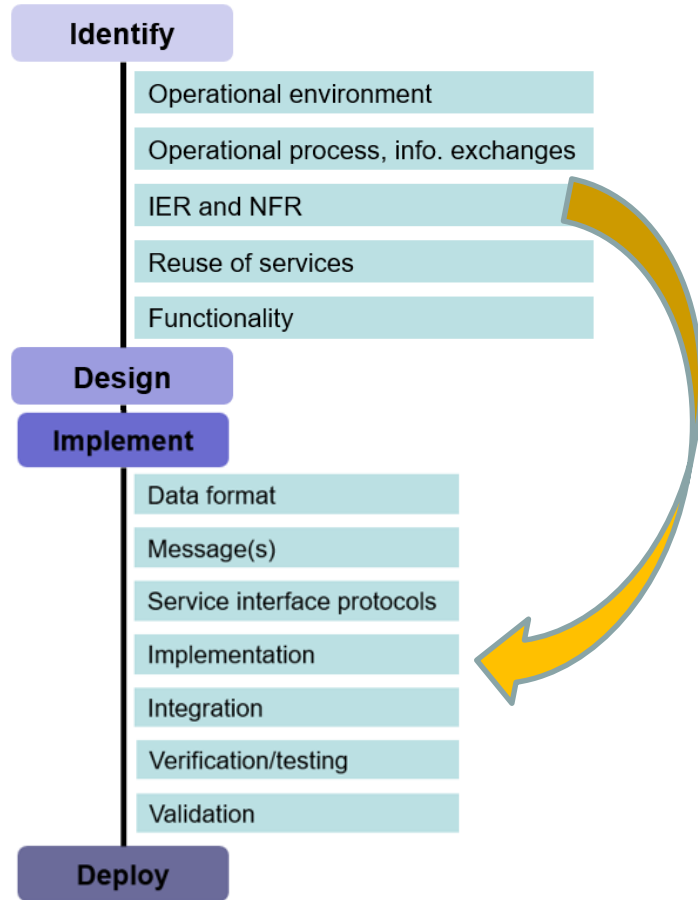


Non-functional requirements cover all the remaining requirements which are not covered by the functional requirements.

Quality of Service (QoS) is the degree or level of confidence that the performance of a service meets the user's requirements.

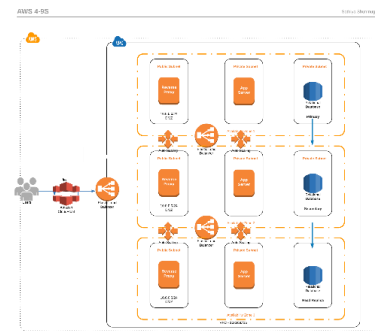
ICAO SWIM Vocabulary

NFRs Influence Implementation

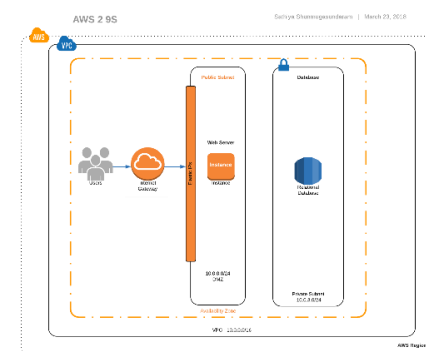


- NFRs Influence TI Implementation:
 - Deployment architecture
 - Infrastructure resources
- Consistent approach required between:
 - Service Identification
 - TI Implementation

e.g. availability



99,99%



99%

Resources



Resources



ISO 25010

<https://iso25000.com/index.php/en/iso-25000-standards/iso-25010>

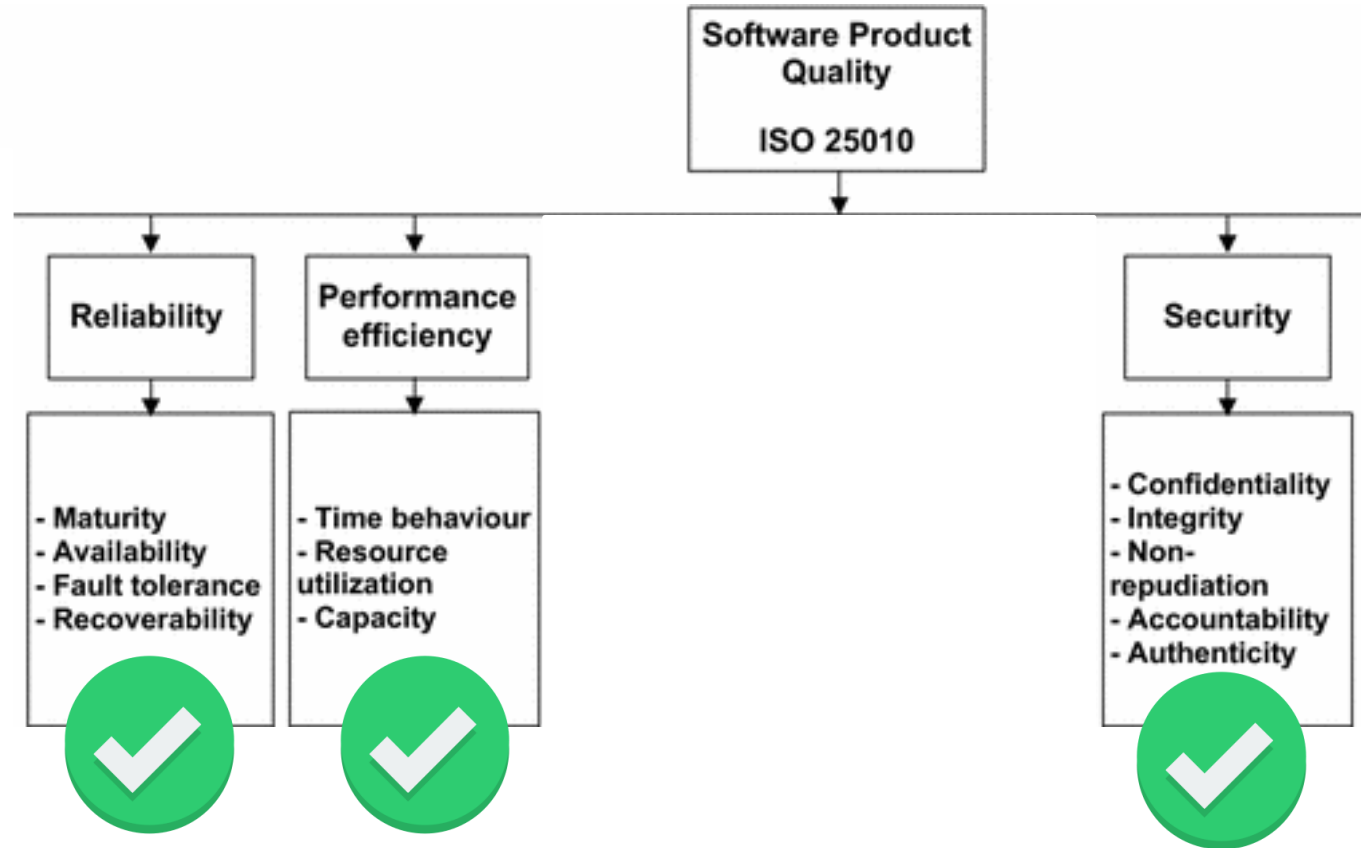
Resources



SWIM TI Foundation

<https://ost.eurocontrol.int/sites/AISWIM/SWIMspecs/TEC/Shared%20Documents/Supporting%20Material/01%20-%20SWIM%20TI%20Foundation/SWIM%20TI%20Foundation.docx>

Reference: ISO 25010



Quality of Service – Attributes Overview

Categorized into performance and security parameters, examples of QoS characteristics applicable to the implementation of SWIM Information Services are:

- Performance parameters
 - Availability
 - Capacity
 - Response time or latency
- Security parameters
 - Integrity
 - Confidentiality

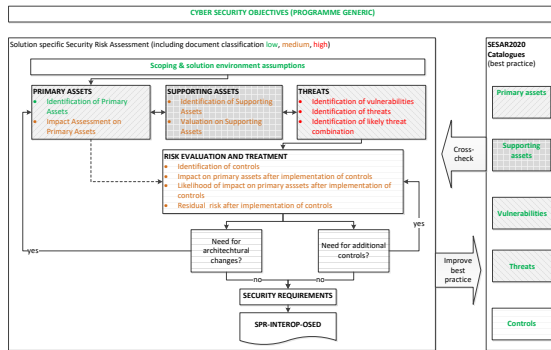
ICAO Doc10039 Vol2 (Draft)

Determination of QoS



- Summary values typically associated with QoS hide the complexity and rigor required on how these need to be determined.
e.g. availability 99.95%
- Some QoS (Confidentiality, Integrity, Availability) are better expressed based on their criticality (= *Impact x Likelihood*)
 - Impact: what happens when something goes wrong.
e.g. Impact = Partial loss of traffic capacity in congested sectors, based on the lower efficiency of the contingency system.
 - Likelihood determined later on during design/implementation.

Security Risk Assessment

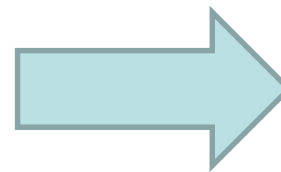


SESAR SecRam

Impact

What if information exchanged is:

- Maliciously altered
- Not available for period of time
- Released to the general public

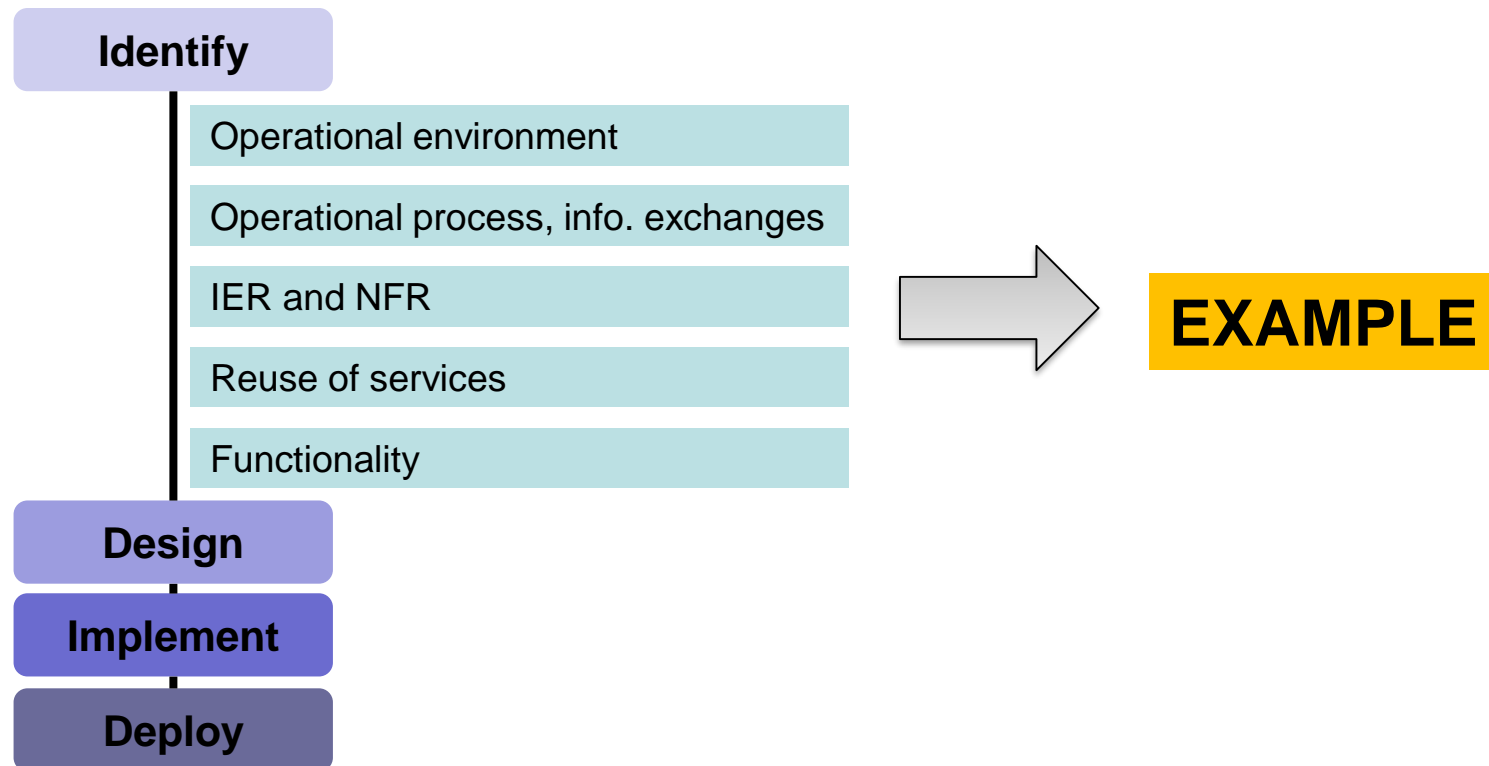


	5	4	3	2	1
IMPACT AREAS	Catastrophic	Critical	Severe	Minor	No impact / NA
PEOPLE	Fatalities	Multiple Severe injuries	Severe injuries	Minor injuries	No injuries
CAPACITY	Loss of 60%-100% capacity	Loss of 60%-30% capacity	Loss of 30%-10% capacity	Loss of up to 10% capacity	No capacity loss
PERFORMANCE	Major quality abuse that makes multiple major systems inoperable	Major quality abuse that makes major system inoperable	Severe quality abuse that makes systems partially inoperable	Minor system quality abuse	No quality abuse
ECONOMIC	Bankruptcy or loss of all income	Serious loss of income	Large loss of income	Minor loss of income / increased expenses	No effect
BRANDING	Government & international attention	National attention	Complaints and local attention	Minor complaints	No impact
REGULATORY	Multiple major regulatory infractions	Major regulatory infraction	Multiple minor regulatory infractions	Minor regulatory infraction	No impact
ENVIRONMENT	Widespread or catastrophic impact on environment	Severe pollution with long term impact on environment	Severe pollution with noticeable impact on environment	Short Term impact on environment	Insignificant

Potential Further Work

- Guidance ensuring consistent approach to NFRs (promoting reuse of existing methodologies)

Non Functional Requirements



NFRs

- Performance
 - Availability
 - 99.95 %, *Partial loss of airport capacity, based on the lower efficiency of the contingency system.*
 - Capacity
 - 2000 service requests per hour
 - Response time or latency
 - 2s delay for 95% of messages
- Security
 - Integrity
 - *Medium impact: Very likely loss of capacity at airport due to unnoticed fraudulent data modification.*
 - Confidentiality
 - *Low impact. If recurrent, potential loss of reputation.*

Non Functional Requirements

