Final Project Report

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Abstract

This document has been produced in the context of the P08.03.01, Operational ATM Requirements and Demands concerning Supervision of the entire European ATM sharable Network.

The document is the project end report and provides an overview of the work done in the project on .SWIM Supervision, which encompass major functional areas: Configuration Management, Fault Management, Performance Management, Security, Safety, Legal recording.

As no confirmed SWIM supervision requirements were found, outside local supervision, the recommendation is to close the project.

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Rational for rejection
None.

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Publishable summary

In the context of the SWIM Thread, and in particular of WP8 Information Management, the SESAR Project 08.03.01 is devoted to the analysis and production of operational requirements to cover the SWIM Supervision. This can be seen as a cube with several edges that have to be all covered:

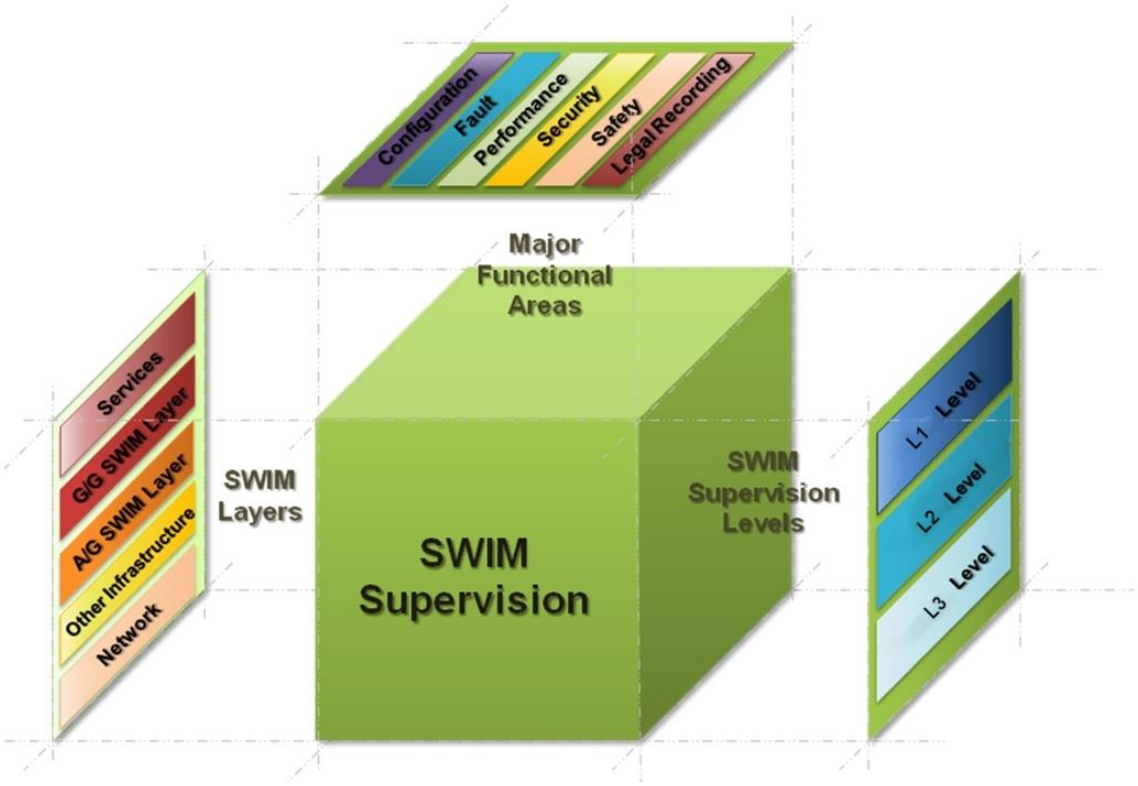

Figure 0.1 SWIM Supervision "cube"

Supervision

The scope of the project concentrates on the analysis and production of requirements to cover the supervision of:

1) Network Infrastructure. The project planned to analyse which network-related information was required of interest by the SWIM Supervision and translate it into operational requirements.
2) Other Infrastructures (e.g. Registry / Directory, PKI, etc). The SWIM network requires infrastructure like the Registry / Directory, PKI, etc. This infrastructure will have also to be supervised, so the project was planning to cover also this part.
3) G/G SWIM Layer. This part comprises all G/G SWIM middleware and the systems where such middleware will be running. This project did not plan to deal with the definition of this G/G SWIM layer (middleware and systems).
4) A/G SWIM Layer. This part comprises all A/G SWIM middleware and the systems where such middleware will be running. This project did not plan to deal with the definition of this A/G SWIM layer (middleware and systems).
5) Services supervision. The project scope planned to analyse the different ATM Services defined by other SESAR projects and define the operational requirements for the supervision of such services.

The requirements were independent of the architecture (which could be centralised, decentralised or mixed). When necessary, the project planned also to make proposals for different logical architectures

to implement the Supervision at the different levels, making a comparison between them (advantages / disadvantages).

The project planned to analyse the roles and responsibilities of the different actors involved or concerned by such supervision.

The project covered the following major functional areas of the Network Management Model defined by the International Organization for Standards (the ISO/IEC 7498-4 standard): performance management, configuration management, fault management and security management. The functional area of accounting were not planned to be covered.

Security

The project planned to focus on security related aspects of the supervision.

This included assessing the impact of Security policies on Supervision including e.g.:

- Security requirements to be applied to the supervision function itself (e.g. access control to it: authentication / authorisation, etc.)
- Requirements related to the management of supervision information related to security incidents (e.g. forwarding this information to appropriate actors like Military and / or Security Authorities)

Safety

The project planned to concentrate in the two following points related to safety:

- The requirements to ensure that the Supervision function does not jeopardize any other operational services (safety shall be addressed within each ATM service).
- The requirements to ensure that the Supervision function detects and indicates the faulty situations in the (monitored) systems and allows taking the necessary measures, concerning supervision, in order to restore the service without jeopardizing the safety of the ATM environment.

Legal recording

The project planned to cover the requirements regarding legal recording for the supervision itself. I.e., the requirements to cover the recording of all data exchanged in the context of the supervision function (e.g. events), commands issued and their results, etc.

1 Final Project Report

1.1 Results of the Project

The result of the project is a **SWIM Supervision Concept of Operations**. A brief summary of the content of the Supervision ConOps has been provided below.

SWIM Supervision

SWIM Supervision is responsible for monitoring and controlling the SWIM technical infrastructure and services provided by it and used by the ATM Services.

The control (if any) of ATM services are in charge of Local System Supervision.

In this context, **services** could be split into:

- Those provided by SWIM Technical Infrastructure;
- Those provided through SWIM and the physical network infrastructure (i.e. PENS) that fulfils the information exchange/sharing connecting the SWIM Nodes.

Local Supervision

Local System Supervision has been defined to monitor and control components and services provided both internally and externally by the "local" system (which might also mean that it will have to monitor more than one "site"). Local System Supervision will be monitoring services provided via/through SWIM and contributing to the SWIM Supervision. Every ATM System will have some sort of Local System Supervision and it was agreed not to be in the scope of SWIM Supervision.

Supervision scope

The SWIM Supervision scope covers the three different geographical scopes (or levels) respectively identifiable as local, sub-regional (site and/or FAB) and Regional (European). An overview is given through the following figure.

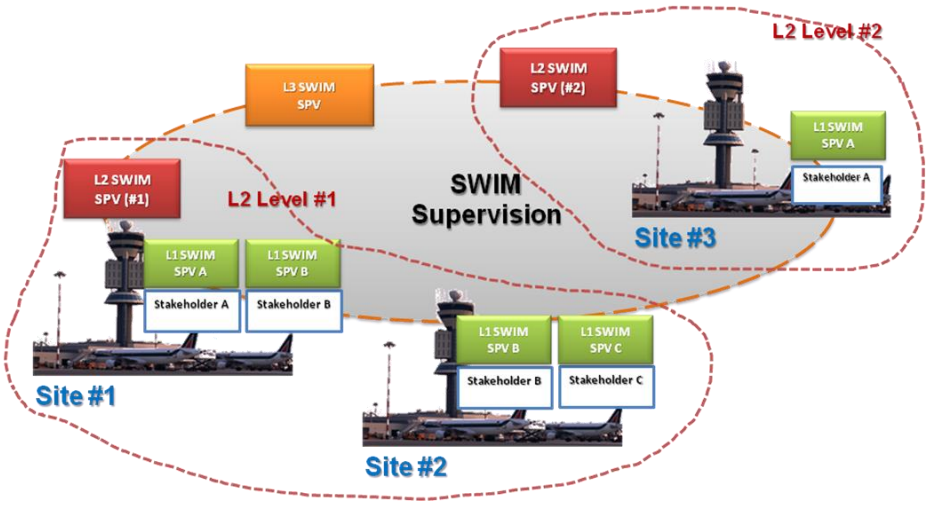

Figure 1.1 – SWIM Supervision Geographic scope

Main Logical Architecture

The Supervision ConOps focuses on the SWIM Supervision Logical Architecture.

The Logical Architecture has been structured by the project into 3 hierarchical layers, in order to provide an increasing level of detail, starting from the system view to the level of the single functionality; namely:

- System Layer, which is the highest level and was intended to give an overview (scenario) on the whole Supervision; a high-level context view was intended to be provided, in order to identify involved actors (human and/or systems), without detailing the diverse functionalities.
- Major Functional Areas Layer, which corresponds to the level of the Major Functional Areas (see below); for each of them a description and a context view was intended to be provided, in order to identify the interactions between actors and major functional areas. The Supervision ConOps covered the following major functional areas of the Network Management Model defined by the International Organization for Standards (the ISO/IEC 7498-4 standard, describing a network management framework):
  - performance management,
  - Configurations Management at Regional/Sub-regional/Local Levels
  - Errors and incident management at Regional/Sub-regional/Local Levels
  - End to end Information/Applications performances management at Regional/Sub-regional/Local Levels
  - Security Management at Regional/Sub-regional/Local Levels
  - Safety
  - Monitoring, Analysing and reporting functions related to the sharable Network

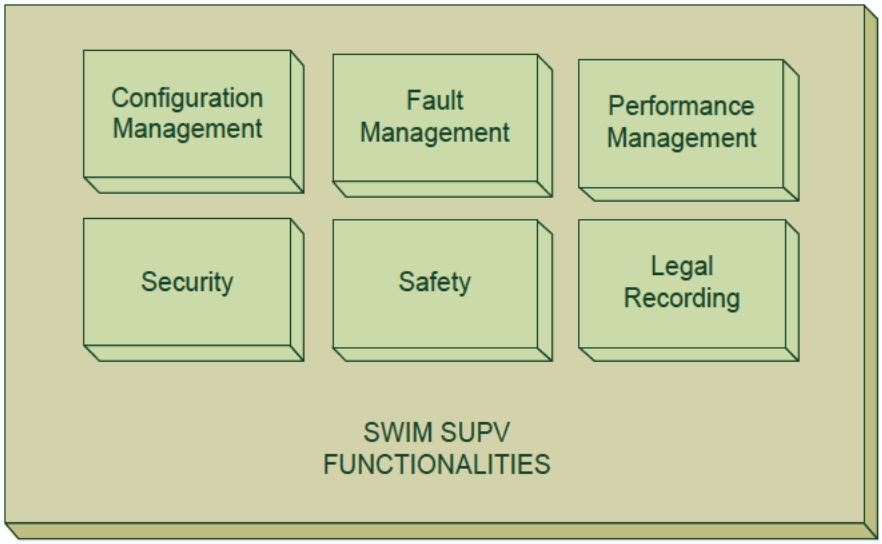

Figure 1.2 SWIM Supervision Major Functional Areas

  - The major functional area of accounting was not addressed (for two main reasons: a) there were no accounting requirements identified in the SESAR definition phase; b) because historically it has never been covered in ATM).
- Functional Layer, since SWIM supervision would be implemented, for each functional area, through the provision of functionalities. In order to complete the Logical Architecture description, such functionalities were identified, described and analysed in terms of interfaces and data flows among them. Example of the functionalities that were analysed are the system to system (supervision) interfaces, the end user (supervision) interface and any other external user interface (linked to supervision).

In the Supervision ConOps, each architectural layer took into account the local, sub-regional (site and/or FAB) and Regional (European) geographical levels, Roles and Responsibilities, identifying interactions among them.

1.2 Difference between initial and final scope

The main difference between the initial scope and the final scope for P08.03.01 is due to the fact that the project was stopped due to a lack of requirements for SWIM supervision (other than the local supervision level). Therefore the project was not able to reach the whole set of initially fixed objectives.

1.3 Project deliverables

A summary of the project deliverables is presented in the table below:

Del. code	Del. Name	Description	Assessment Decision
D000	Close-up report	The deliverable (**this document**) comprises the P08.03.01 Final Project Report.	delivered
D008	SWIM Supervision ConOps V2	SWIM Supervision Concept of Operations (ref. [1]).	No reservation (P)
D014	SWIM Supervision Concept of Operations	SWIM Supervision Concept of Operations (ref. [2]).	No reservation

1.4 Contribution to standardization

The project has not contributed to standardisation activities (EUROCAE/RTCA, ICAO, EUROCONTROL, OGC…) (nor has its members on behalf of the project).

1.5 Project Conclusions and Recommendations

The project 08.03.01 raised concerns over the lack of clarity whether there was a need for supervision beyond the local level (i.e. under responsibility of a single organisation). At the time B.04.03 was asked for an opinion. The only response received came from NATS, which also clearly questioned the need for supervision beyond the local level.

With four projects in the programme dealing with technical supervision developments and only 08.03.01 dealing with operational requirements for SWIM supervision, and with questions on their fit in the programme being raised for all of these projects, there was an initiative to create a supervision working group with all of them. This initiative did not lead to a clearer view on what was expected in this area.

In May 2012, project 08.03.01 submitted a CR requesting its activities to be put on hold until there was a clear need confirmed by the stakeholders for technical supervision beyond the local level.

The conclusion of the assessment with stakeholders is that no clear needs can be identified for continuing work on SWIM technical supervision in the SESAR programme.

The conclusion of the project is that:

- There is no confirmed need for SWIM technical supervision capabilities beyond the local (i.e. within an organisation) level.
- SWIM technical supervision at the local level does not require ATM specific standardised solutions.

- The need for SESAR to continue its investments in developing SWIM technical supervision is not demonstrated.
- There is no need to continue the work of project P08.03.01

2 References

[1] D14 Concept of Operations for SWIM Supervision – https://extranet.sesarju.eu/intraprogman/Assessment%20Library/DEL08.03.01-D014-Concept%20of%20Operations%20for%20SWIM%20Supervision.doc

[2] D08 Supervision ConOps v2 https://extranet.sesarju.eu/WP_08/Project_08.03.01/Project%20Plan/DEL08.03.01-D08-Concept_of_Operations_for_SWIM_Supervision_00.01.02.doc

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