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15 July 2020

To: All Nominated Prospective Bidders

Subject: **IFB-CO-15079-IAS "Provide Information Administration Services and Upgrade NATO Information Portal (IAS), Amendment No 5 and Clarification Request Responses Release no 4**

Reference(s): A. AC/4-D/2261(1996 Edition)
B. C-M(2002)49-COR12
C. AC/4-DS(2019)0014
D. BC-DS(2019)0027 (INV)
E. NCIA/ACQ/2020/6616 dated 20 April 2020
F. NCIA/ACQ/2020/6751 dated 29 May 2020
G. NCIA/ACQ/2020/6773 dated 8 June 2020
H. NCIA/ACQ/2020/6845 dated 24 June 2020 (corrected ref)
I. NCIA/ACQ/2020/6881 dated 7 July 2020

Dear Sir/Madam,

1. Please be advised, **THE CLOSING TIME FOR SUBMISSION OF BIDS IN RESPONSE TO THIS INVITATION FOR BID REMAINS 12:00 HOURS (BRUSSELS LOCAL TIME) ON FRIDAY, 24 July 2020.**
2. Please find attached Amendment No 4 including Clarification Request Responses Release no 43, including all previous responses
3. Please find attached Amendment No 4 Comprising the following documents :

Reference	Replaced with/added
Book 2, Part IV, the Statement of Work Annex A , System Requirement Specification, (Amendment No 3)	Book 2, Part IV, the Statement of Work Annex A , System Requirement Specification, (Amendment No 4)

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4. Bidders are advised that they should use the link in paragraph 2.3 of the Bidding Instructions to deliver their bids and inform the Purchasers point of Contact at paragraph 2.5 that a bid has been submitted.
5. The Purchaser point of contact for all information concerning this IFB remains unchanged.

For the Director of Acquisition,

[Original Signed By]

Graham Hindle
Senior Contracting Officer

Attachments: Annex A Clarification Request Responses No. 4



NATO Communications and Information Agency
Agence OTAN d'information et de communication

IKM TOOLS

IFB-CO-15079-IAS

BOOK II - PART IV SOW Annex A

SYSTEM REQUIREMENTS SPECIFICATION (SRS)

Document History

Edition	Date	Description
1.0	04/10/2019	Export from DOORS repository

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1 Introduction

1.1 Purpose

This System Requirement Specification (SRS) describes the external behaviour of the system to be delivered under the IKM Tools project. It also describes non-functional requirements, design constraints and other factors necessary to provide a comprehensive description of the requirements for the system.

1.2 Scope

This SRS supports the NATO Capability Package (CP) 9C0150 Core Information Services for Command and Control that identifies the capability and resources required to provide information services that need to be accessible to all users, regardless of Community of Interest (COI). The Capability Package reflects the minimum requirement to support the command and control of all military functions.

The basic SRS as contained in the requirement management tool (DOORS) contains the currently identified set of requirements for the IKM Tools (NIP, EDMS and TT+) covered by:

- Project CP9C0150 0IS03095 (“Provide Information Administration Services”), which covers the design of an initial enterprise-level core data management service capability to the NATO Command Structure that is consistent with the requirements of Deployable CIS, development and implementation across the enterprise of the initial capability to provide workflow and workspace services on the NATO Secret (NS) and NATO Restricted (NR) networks;

1.3 Background

The purpose of this project is to deliver the underlying IKM Tools that will enable NATO to rapidly deliver integrated information systems. The IKM Tools will allow other projects to use consistent, coherent and proven solutions to common problems, allowing them to focus on delivering real business value to NATO. Together with the Infrastructure as a Service (IaaS) delivered by the ITM project, this project will change the way NATO builds and procures functional area services (FASs) and user applications. The reuse of existing services and components will ensure that NATO achieves a greater return on investment on information systems. At the same time, the ability of different Communities of Interest to share and distribute information in a controlled way to a broader range of partners will ensure that the Alliance meets its “Responsibility to Share”.

1.4 Acronyms and Abbreviations

The acronyms and abbreviations used in this SRS are defined in Annex E of the Statement of Work.

1.5 Definitions

The definitions used in this SRS are defined in Annex E of the Statement of Work.

1.6 References

The abbreviated document titles given in square brackets, [...], are used to refer to documents in the reference list.

1.7 Overview

This SRS comprises 4 sections:

- Section 1 provides an introduction and the use of this document.
- Section 2 provides an overall description of the IKM Tools Services, roles involved and project constraints.
- Sections 3 and 4 contain the Functional and Non-Functional Requirements comprising the required functionality and their associated requirement attributes.

During the system requirements analysis and design (Design Stage), further elaboration of IKM Tools Information Objects will be required, and, almost certainly, additional Information Objects, products, attributes and relationships will be identified to implement the requirements.

1.8 SRS Conventions

The system requirements, defined in this document, are individually identified by a unique number which shall be used at all times as the specific reference for each.

No meaning is associated with the order of serial numbering. There could be gaps in numbering and requirement identifiers in a group do not have to be sequential.

Requirement identifiers are encapsulated in square brackets.

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [IETF RFC 2119, 1997].

1.9 Standards and Specifications

Changes to identified standards and specifications (e.g., Interface Control Documents, STANAGs) are anticipated prior to the deployment of the IKM Tools capability. In cases in which changes to the standards/specifications are not major and are identified to the Contractor prior to the end of the Detailed Design Phase, no additional cost shall accrue to the change in standard/specification. Changes which shall not be considered major include those in which:

- The same technology is used (e.g., Web Services)
- There is no significant increase (< 20%) in the number of information objects/attributes supported
- There is no significant increase (< 20%) in the number of classes/methods supported
- There is no significant increase (< 20%) in the number of required settings (e.g., security settings)
- No specialised COTS hardware or software components are required to implement the changes

Some given references are for draft versions of documents (e.g. "Edition 4 Ratification Draft"). Where this is done, the Contractor shall use the draft document as given with the expectation that it shall be ratified without any substantial change.

Changes in standards/specifications as part of a normal technological GEN/maintenance path (e.g., Windows Vista to Windows 7, .NET Framework 3.5 to .NET Framework 4.0) shall not be considered to be major.

1.10 Verification Methods

The requirements in this SRS will be verified through qualification, herein defined as an endorsement with a guarantee and supporting documentation that the item being qualified satisfies the specified requirement(s). The different verification methods applicable to the requirements herein are described in the following paragraphs.

Note: In some cases, more than one verification method might be required in order to verify fulfilment of a requirement.

1.10.1 Inspection

Inspection is the visual examination of an item (hardware and software) and associated descriptive documentation. Verification is based on the human senses (sight, touch) or other means that use simple measurement and handling methods. No stimulus is necessary. Passive resources such as meter rule, gauge may be used.

For Non-Developmental Items (NDI), Modified NDI and Developmental Items, hardware inspection is used to determine if physical constraints are met, and hardware and/or software, inspection is used to determine if physical quantity lists are met.

1.10.2 Analysis

Analysis is the review and processing of design products (documentation, drawings, presentations, etc.) or accumulated data obtained from other qualification methods, such as manufacturer's tests of a product to be mass-produced, to verify that the system/component design meets required design criteria.

1.10.3 Testing

Testing is the operation of the system, or a part of the system, under controlled and specified conditions, generally using instrumentation, other special test equipment or specific test patterns to collect data for later analysis. This verification method usually requires recorded results to verify that the requirements have been satisfied.

2 General System Description

2.1 Product Perspective

2.1.1 Purpose of the IKM Tools

2.1.1.1 Intended Use

Requirement ID: IKM-SRS-1

The IKM Tools shall be enabled for the ON and the PBN with equivalent functionalities. The target audience are users in need of collaboration by

sharing information, executing tasks and alike cooperation activities accessible via web browser application.

Other users will be services and FAS applications that directly interact with the underlying IKM Tools information platform and as a result benefiting from the collaboration features IKM Tools provides.

Finally basic information exchange will be allowed between IKM Tools in different domains limited by the policies and technology available between Data Centers.

Verification Method: Test

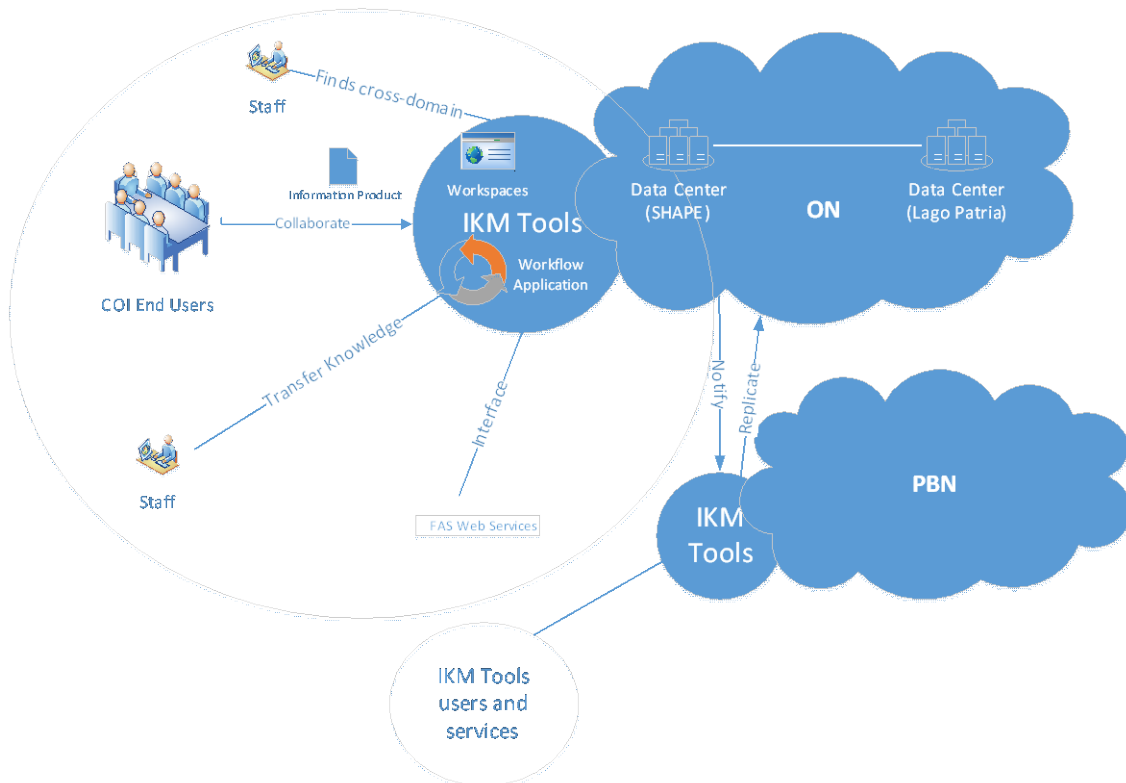


Figure 1 IKM Tools Operational Concept

2.1.1.2 Interoperability

The IKM Tools services will be interoperable with similar services in the deployed and federated domains, through clearly defined interfaces based on agreed open standards.

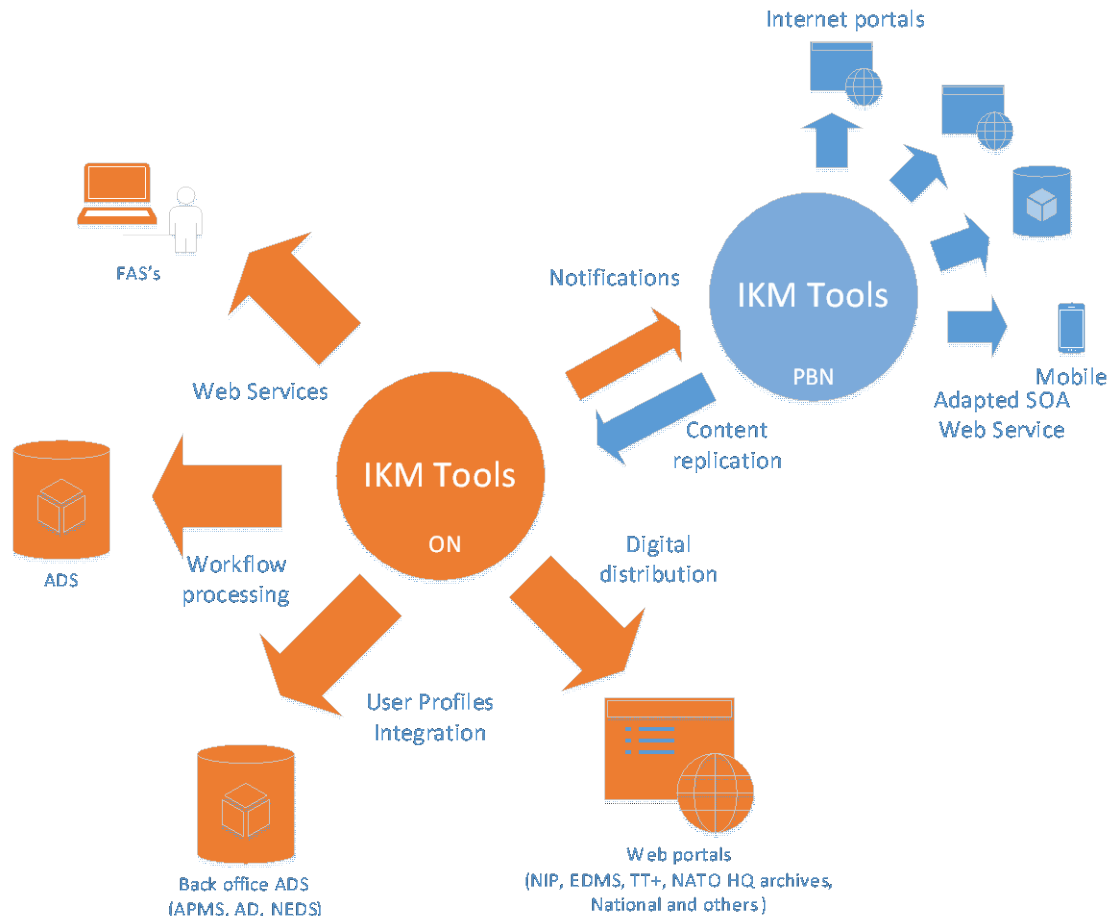


Figure 2 External Interfaces

IKM Tools will interface with similar systems in both ON and PBN networks. However in the ON with more restrictive access control to information.

In the PBN as it will use the ITM infrastructure it will be installed in the NR domain to be able to cross communicate with the IKM Tools in the ON.

The IKM Tools services will be consistent with the requirements of Deployable CIS (DCIS), see section NATO Bi-SC AIS Deployable CIS.

The implementation of comprehensive cross domain services is outside of the scope of this project. However, this project will leverage any existing border protection and cross domain services where these offer mechanisms for information exchange across security domains (both with NATO and external domains). This project will also provide the information products in the needed format for the cross-domain solution. The coordination between this project and CP 9C0150 Project 2012/OIS03102, which will implement additional cross-domain solutions, is within scope of this project.

This IKM Tools will support the integration of FASs and user applications via standard interfaces and API as web services, e-mail or File Transfer Protocol (FTP).

The IKM Tools may interface with NATO Nations CIS provided they implement standard protocols and interfaces as IKM Tools and that the border protection mechanism is configured.

2.1.1.3 Modes of operation

The technical solution to be provided for the IKM Tools will be able to support modes of operation including peacetime, crisis, and exercise, from the static locations through network connectivity.

Requirement ID: IKM-SRS-2

IKM Tools shall be deployable to the MIR and to disconnected network nodes.

Verification Method: Test

Mission Secret capacity provisioning is not within the scope of this project. Installation of the IKM Tools on the Deployable CIS provided by CP0A0149 is outside of the scope of this Project.

2.1.2 Scope

An internal logical architecture of the IKM Tools is presented in Figure X.

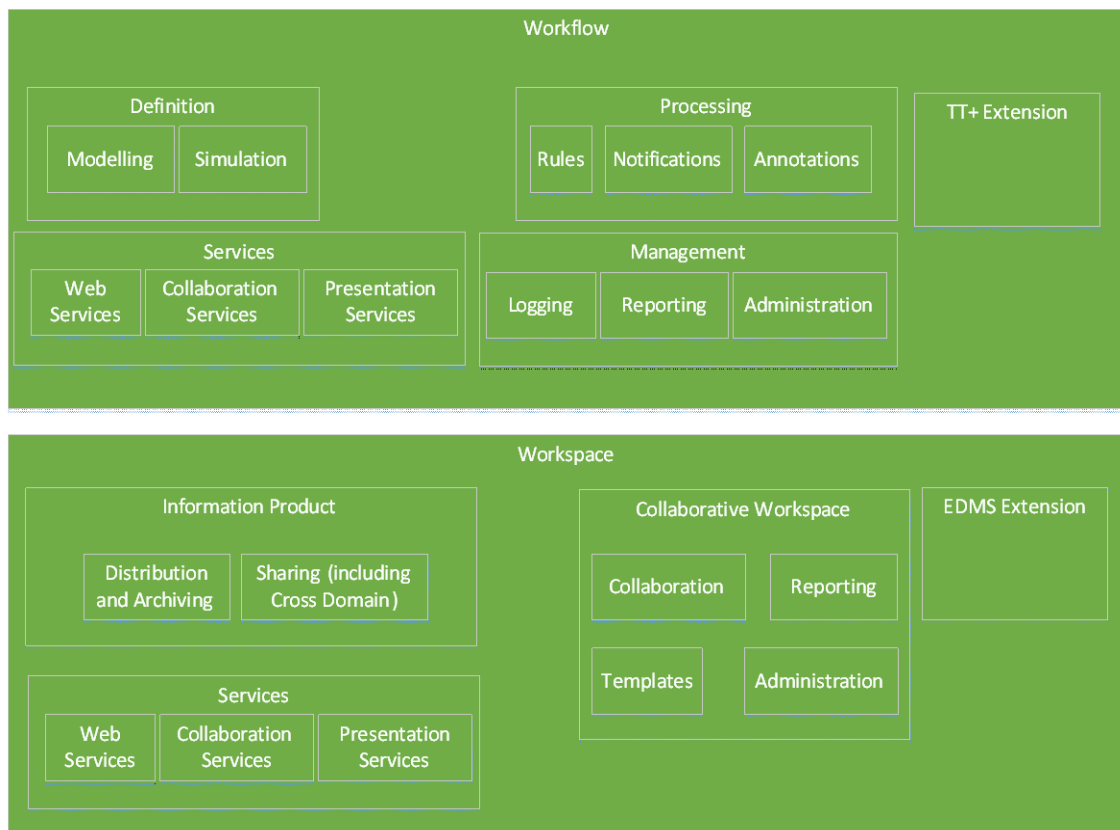


Figure 3 NSOV-1 Service Taxonomy

The main categories in this logical architecture are:

The **Workflow**: consists of all components IKM Tools will develop to enable a workflow capability for process automation. Dependant components are not included like IKM Tools Framework Runtime or Security modules that will be delivered by other projects.

Supports the synchronisation of directory data between the different NATO directories

The **Workspace**: consists of all components IKM Tools will develop to provide collaboration workspaces for user cooperative work. As the Workflow category it does not contain dependant modules.

2.1.3 Users and Roles

The IKM Tools will provide a wide range of functionality and benefits to various users:

NATO End Users will interact directly with the IKM Tools services via the Graphical User Interface (GUI), typically using a web browser. The IKM Tools will expose the services in a friendly and consistent manner to improve access to information and increase user mobility. At the same time it'll hide the complexity of the underlying services and will show a modern, industry-standard user experience (UX).

Solution Architects and Developers will indirectly interact with the IKM Tools services, designing their systems or FASs to integrate with IKM Tools and benefiting from its functionality. The ability to leverage existing IKM Tools services will mean that new portals will be quicker and more cost-effective to develop and integrate within NATO CIS. At the same time it will standardized IKM Portals with the inherent benefits of sharing similar UI, technical knowledge and support; resulting in an overall increase of Return On Investment (ROI) of NATO systems.

External Partners will benefit from federation capabilities offered by the IKM Tools services. There will be a consistent way to integrate federated systems, so that information extends across NATO and partner networks (NATO Enterprise, Alliance Enterprise and Coalition Enterprise). The IKM Tools will provide a common web platform delivering IKM services, both military and CIMIC. This will provide extensive information superiority ("Responsibility to Share"), while simultaneously ensuring that information is released only to those with a "Need to Know".

And the user roles envisaged in the IKM Tools aligned with the current NIP roles are:

Business role: to provision IKM services like workflows and workspaces

IKM Manager role: to control and govern the information in the IKM Tools by setting up managed metadata, taxonomies, content types, policies for retention and disposition, naming conventions and all related IKM management activities.

Operational role: the ones to operate the IKM Tools day to day, as End User by acceding and using the IKM Tools user facing features or as an Administrator with higher privileges to manage and maintain the technical functions of IKM Tools.

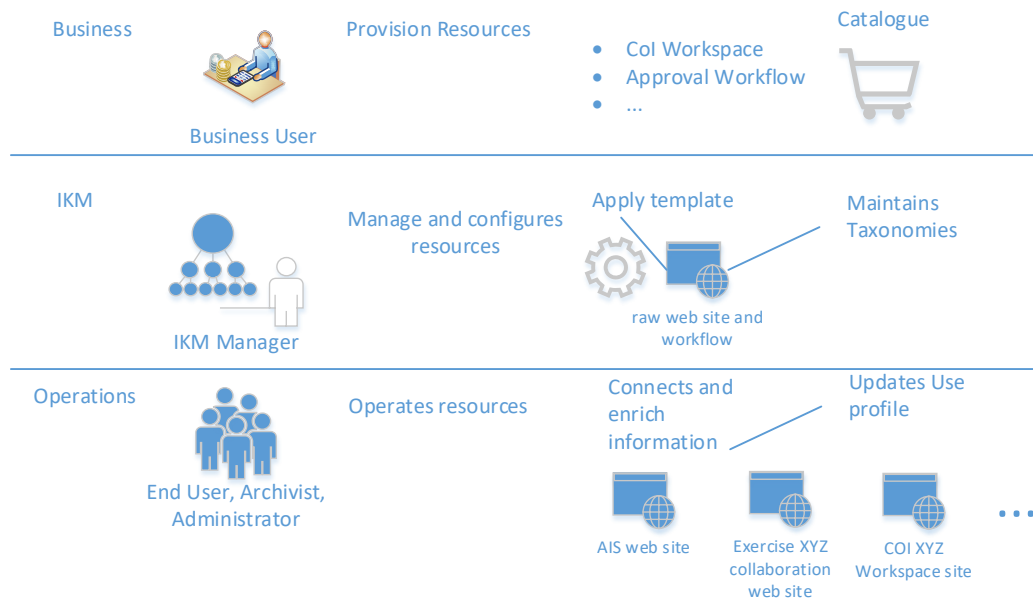


Figure 4 Roles in IKM Tools

2.2 General Constraints

2.2.1 Relationships with other programs

The IKM Tools is part of the Bi-SC AIS as defined in the Bi-SC AIS Reference Architecture [NAC AC/322-D(2005)0037, 2005].

The Bi-SC AIS is NATO's Command and Control Information System used throughout the NATO Command Structure, in NATO Command Deployments and in NATO Exercises. The Bi-SC AIS is in turn one element of NATO's overall CIS Capability, which includes a number of strategic sub-systems such as the NATO IKM Tools Framework (aka NIP Core), Communications Network, Planning, Intelligence, Theatre Missile Defence, and Deployable CIS and so on.

Requirement ID: IKM-SRS-2b

The capability shall comply with the NATO Policies [C-M(2015)0041-REV2].

The capability to be acquired under the Capability Package CP 9C0150 is to be a fully integrated element of the Bi-SC AIS.

In this context, the IKM Tools will co-exist and may interact with Intelligence Functional Services (Intel-FS), Logistics Functional Services (LOG FS), Maritime Functional Services (MCCIS), Land Functional Services (LC2IS), Air Functional Services (AirC2IS), Planning Functional Services (TOPFAS) and other functional services (such as Common Operational Picture, JCOP or NCOP; or Joint C2 Functional Services, JC2IS) as they become available.

2.2.2 Existing Capabilities

2.2.2.1 Related Projects

2.2.2.1.1 IT Modernisation (ITM)

The ITM project will transform the way IT services are provided to users across the NATO enterprise, including the NCS, the NATO Headquarters (NHQ) and NATO agencies. It will provide Infrastructure as a Service and an Enterprise Service Management and Control Service. ITM is the amalgamation of the three CP 9C0150 Projects: OIS03091; OIS03092, and OIS03101. The IKM Tools will be primarily deployed in the Data Centres delivered by the ITM project. This means that the IKM Tools will be able to take advantage of the ITM infrastructure, thus reducing the amount of Hardware that will need to be specifically procured.

The IKM Tools project relies on the timely delivery of the IT infrastructure by the ITM project.

The IKM Tools project will need to integrate the Service Management tooling with the SM&C framework as provided by ITM.

2.2.2.1.2 NIP

The NATO Information Portal (OIS03031 under CP 5A0050/9B0020) is the official NATO portal in ON domain and available to the majority of the NCS Commands. It provides Enterprise Search Services, Portal Services and Metadata Services (e.g. NIP term store).

Requirement ID: IKM-SRS-3

These mentioned services are to be used whenever possible by IKM Tools. In addition IKM Tools shall take into account these services consistency when proposing new IKM Tools GUI design and operatively.

Verification Method: Analysis

2.2.2.1.3 Email and IKM resilience (UR 2015)

Current IKM tools (NIP, EDMS, TT+) and Email are known to run on single location instance installations that include Single Point of Failure components, one Data Center. Potential outages/disasters could impact business for a significant time. NCIA has started a project to provide an interim resilience until ITM delivers the wave 3 (e.t.a. 2021).

2.2.2.1.4 IAS Step 1: EDMS and TT+

The IAS Step 1 has implemented the EDMS and TT+ applications hosted in the IKM Tools Framework Share Point infrastructure. Around 20 Commands are in use of these applications.

The EDMS was an upgrade of previous the DHS application and provides a Document Management System for the Commands, to work with documents organized in different Organizational Units (OU) as Site Collections.

The IAS Step 2 is to improve some missing EDMS features and to interact with it to enhance the workspace capabilities.

The TT+ was the update of the previous TTE and provides a staff tasking functionality where staff are assigned tasks and collaboratively contribute in workspaces to fulfil them.

The IAS Step 2 is to improve the TT+ with extra features.

2.2.2.1.5 NATO Enterprise Directory Services (NEDS)

The NATO Enterprise Directory Services will provide Directory synchronisation between the various NATO directory and data repositories. The IAS Step 2 project is intended to further integrate the NEDS system via Microsoft Identity Manager (MIM) service, with additional data sources (e.g. NPKI and Physical Access Control Systems) and to deploy it onto the PBN.

The IAS Step 2 project relies on the NEDS project to deliver the system according to its current scope (i.e. ON).

2.2.2.1.6 NATO Public Key Infrastructure

The NPKI project will deploy a PKI environment for NATO that fully complies with the NPKI Certificate Policy [NAC AC/322-D(2004)0024-REV2, 2008].

The IKM Tools project will provide a number of services, including the integration into the authentication and authorisation services that depend on the implementation of a PKI capability across the NATO Enterprise.

2.2.2.1.7 FAS implementation projects

It is expected that the majority of FASs will take advantage of the services offered by the IKM Tools. This will mean that all FASs will have an interdependency with this project. The components and services that are provided will be an integral part of new FASs.

The fact that the implementations of different FASs that could make use of IKM Tools services have already started challenges the IKM Tools project. This issue will be addressed in several ways:

Projects that are supposed to be implemented in several increments, can postpone usage and integration with IKM Tools services until future increments.

Projects can implement FASs compatible with standards and interfaces identified for the IKM Tools [NAC AC/322-N(2011)0205, 2011], but postpone their use until the availability of IKM Tools. When services provided by the IKM Tools become available, the FASs will be reconfigured to make use of them. Because of implementation of the same standards and well defined interfaces, no additional implementation effort will be required. Detailed descriptions of selected interfaces to be provided by the IKM Tools are available in form of SIPs [NAC ADatP-34(G)-REV1, 2013].

Projects can implement their own IKM Tools services, compatible with the existing IAS Step 1, with the intention of replacing them with the enterprise IKM Tools services, when they become available.

In limited cases, projects will not wait for the IKM Tools but implement their own alternative solutions, often using different technology or based on a dedicated Information Knowledge Management Service.

2.2.2.1.8 Deployable CIS (CP0A0149)

Requirement ID: IKM-SRS-4

The IKM Tools shall be consistent with the requirements of Deployable CIS (see section 4.3.2.2).

Verification Method: Analysis

2.2.2.1.9 Provide Information Exchange Services (2012/OIS03102 under CP 9C0150)

The IAS Step 2 project will leverage any existing border protection and cross-domain services where these offer mechanisms for information exchange across security domains (both with NATO and external domains).

The IAS Step 2 project will coordinate in that respect with the CP 9C0150 Project 2012/OIS03102, which will implement additional cross-domain solutions.

2.2.2.2 Solution/Development Constraints

The IKM Tools will provide the framework upon which many FASs will be built. Consequently the system will need to support the concept of multi-tenancy, where multiple users, processes and activities can access the services simultaneously, while being logically isolated from each other.

In accordance to NATO policy [NAC AC/317-D/71 (Revised), 1996] COTS software should be used in preference to the development of new software unless it evidently contains major disadvantages (e.g. cost effectiveness, negative impact on existing IT infrastructure, security, market stability).

The implementation of physical components on special purpose networks (exercises/training/mission) is outside the scope of this project. These networks will benefit from the services provided under this project through network connection, in accordance with security policy.

Implementation of comprehensive cross domain services are outside of the scope of this project.

Implementation of components in Nations, if required for interfacing purposes, is out of scope of this project.

2.2.3 Operating Environment

2.2.3.1 Node Types

The IKM Tools services will be installed on computing nodes provided by the ITM as depicted in Figure 5 Node types:

Data Centre Nodes – ITM project plans to deliver Data Centres to serve as Main Computing Facilities (MCF) The MCFs will provide the complete suite of IKM Tools services.

Enhanced Nodes (Standalone) will provide a scaled down set of IKM Tools services, with reduced HW footprint for situations where agreed service levels cannot be met through the MCFs. It is anticipated that there will be different service requirements for different types of Enhanced Nodes.

Standard Nodes will be receiving all their services from the MCFs. No IKM Tools services will be installed there.

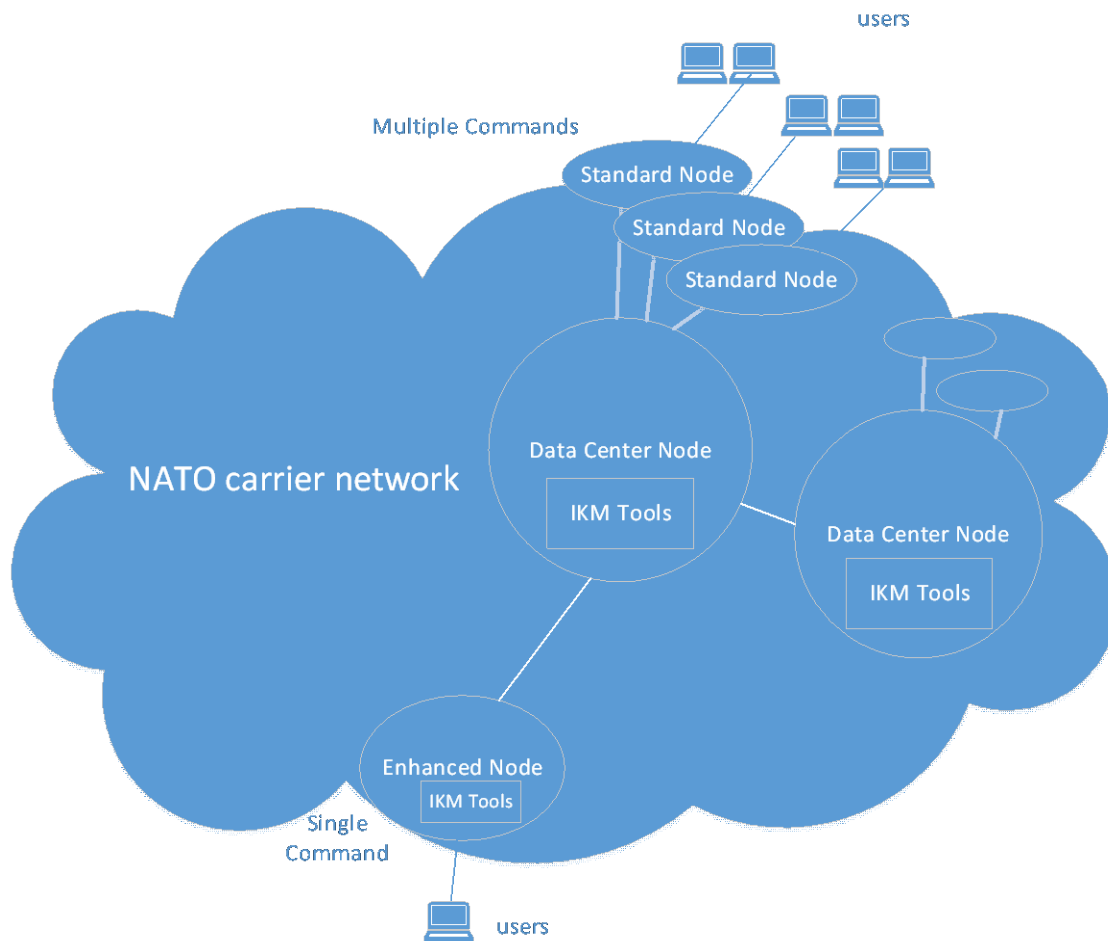


Figure 5 Node types

An **Integration and test facility**, as for example in the Programme Management and Integration Capability (PMIC) environments, will be provided to enable other projects already at their software development phase consistent integration with the IKM Tools services.

A **Reference facility** maintained by the NCI Agency will be used to ensure proper change management and evaluation before installation of NATO information systems integrated with the IKM Tools into operational environment. This will not be on the main ON and PBN networks themselves, but are expected to be located on equipment of the same specification in the Data Centres.

Deployment on the **DCIS** is explicitly out of scope for this project. However all services will be required to be able to run on the DCIS platform. The services that are actually provisioned on a DCIS node will depend on the nature of the mission involved. It is anticipated that a single DCIS node will vary between requiring the full suite of IKM Tools services (comparable to a Data Centre), selected IKM Tools Services (comparable to an Enhanced Node) or none (a Standard Node).

2.2.3.2 Operational Network and Protected Business Network Connectivity

The IKM Tools services will be installed for two major networks (as defined in [SHAPE 3050/SH/CCD CIS/CAR/335/13-301388, 2013]):

The PBN providing IT services at the NU and NR classification level in support of administrative business processes, appropriate operational processes and those processes requiring interaction over the Internet;

The ON providing IT services at NS level in direct support of war fighting processes, processes requiring higher levels of assurance and processes of military and political communications.

As presented in Figure 6, both networks will be implemented with the same logical components, but with separated physical components. The two physical infrastructures will be connected to support required cross-domain information exchanges compliant with, and within the limits of, applicable NATO security policy.

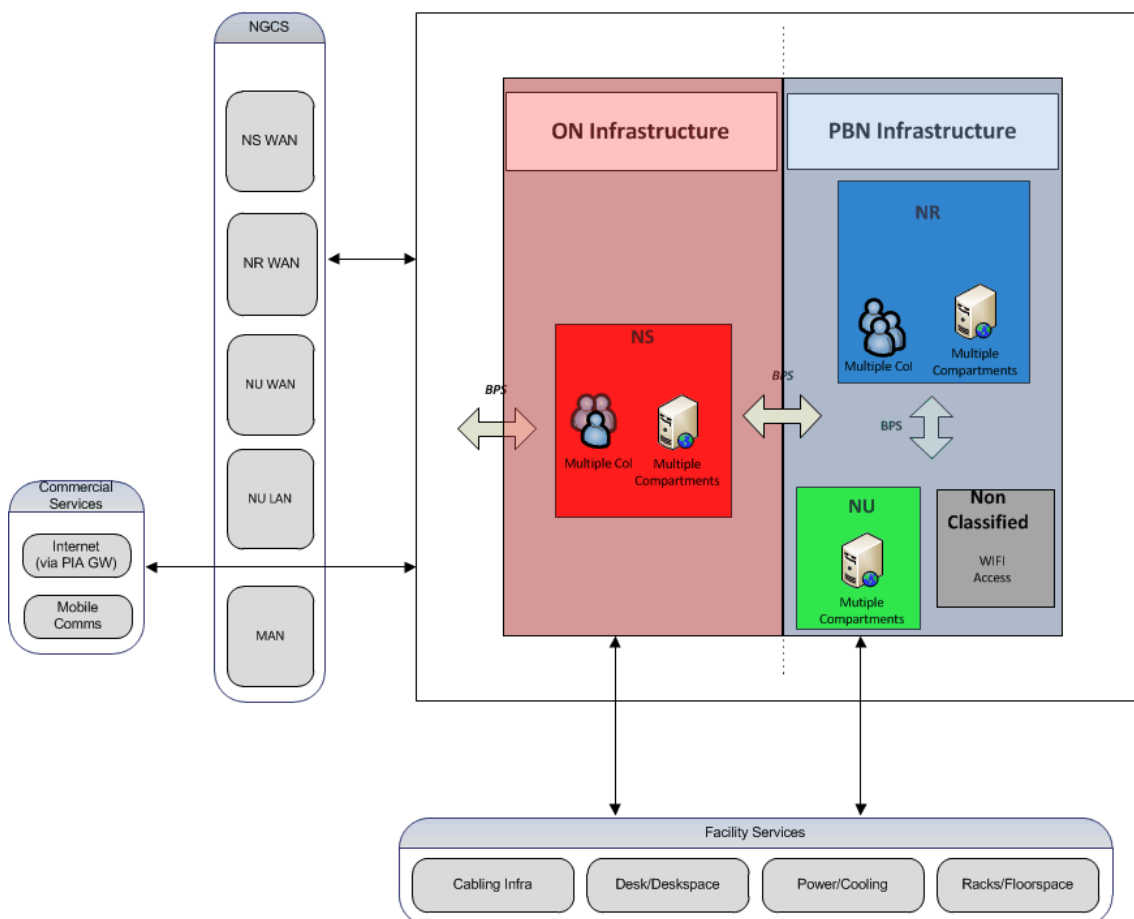


Figure 6 ON and PBN interconnectivity (ref. [CO-13703])

The IKM Tools will be hosted in the NS red box (NS) and in the Business blue box (NR). The communication will be through the Border Protections System (BPS) offered by ITM.

Initially there will be no IKM Tools in the NU green box, nor inside it in the DMZ area. So no Internet facing IKM Tools are foreseen.

The NS and Business domains will both have one security domain respectively so current multiple NS domains will be migrated into one in the target ITM NS. The same accounts for the NR/NU domains.

While ITM strives to unify all members of NATO enterprise into one Enterprise Network, federation capabilities must be implemented and maintained to allow federation of NATO Enterprise and NATO nations to support C4ISR services. Federation is essential to support Exercise Planning, Air Policing and other key NATO capabilities.

However this is the initial situation and it is expected to change over time by including other NATO domains and Nations. As an example, ITM out of scope sites that may need federation are:

- MCCE Eindhoven NLD (NS) hosted in DC Mons
- NFIU BGR/EST/HUN/LTU/LVA/POL/SVK (NS/NU) hosted in DC Mons
- COMMZ Thessaloniki GRC (NS) hosted in LP
- KFOR HQ Pristina RKS (NS) hosted in DC Mons
- MNCNE Szczecin POL (NS/NU) hosted in DC Mons
- MNCSE Bucharest ROM (NS/NU) hosted in DC Mons
- NECCCIS NOR/ISL/LTU

Therefore the IKM Tools shall be federated ready for the above eventuality.

2.2.3.3 Service Provision

From the business perspective the IKM Tools services will be provided through the NCIA Service Catalogue as any other service offered services in the Enterprise.

As from the technical perspective as the IKM Tools services will be used by other projects and systems it'll be needed to early assess the integration and compatibility testing. Therefore, integration testing will be conducted on the IV&V Test Facility and preparation for deployment (including Change Management and Change Evaluation) will be conducted within the Reference Facility.

The system will be centralised as much as possible, mostly at the Data Centres, and with a reduced footprint in the Enhanced Nodes as delivered by the ITM Project.

The Standard Nodes will receive all of their services from the Data Centre Nodes. In exceptional cases, services with special requirements (e.g. regarding availability or performance) that cannot be met when provided from the Data Centre Node will be provided locally by on-site installation, but typically still will be administered remotely.

2.3 Assumptions

It is assumed that the following projects have been delivered, or at least are available for integration to the IKM Tools project:

- ITM
- NPKI
- SOA and IdM

- IAS Step 1
- NIP

It is assumed that future NATO FASs and other information systems integrated by the IKM Tools will be centralized in the Data Centres provided by the ITM project. In exceptional cases, systems not installed in the Data Centres will have sufficient network connectivity (bandwidth and latency) to integrate through the IKM Tools.

The modifications of any other systems (beyond those covered by the pilots) are out of scope of this project.

3 Functional Requirements

3.1 General

3.1.1 Integration

Requirement ID: IKM-SRS-5

The IKM Tools shall leverage the ITM provided Chat and Presence Services, being Microsoft Skype for Business or Microsoft Teams.

Verification Method: Analysis

Requirement ID: IKM-SRS-6

The IKM Tools shall integrate with the ITM Share Point delivered platform, including with the ITM subservices for:

Verification Method: Test, Analysis

- User Spaces: MS My Sites and MS One Drive
- Backups and replication: Metalogix
- Security labelling: Titus Classification Enterprise Suite (Military Edition), ensuring the classification is consistent with the IKM Tools and within the file content
- Performance: Metalogix SharePoint Diagnostic Manager
- Service management: ITM SMC Service
- MS Office products (MS Word, MS Excel, MS Outlook, MS Visio): client and browser based (aka Office Online Server)

Requirement ID: IKM-SRS-7

The IKM Tools shall integrate with Microsoft Exchange Services for sending emails, events, meetings, notifications and appointments to any account within the NATO Enterprise.

Verification Method: Test

Requirement ID: IKM-SRS-8

The IKM Tools shall integrate with MIM for Identity Management

Verification Method: Test

Requirement ID: IKM-SRS-9

The IKM Tools shall integrate with Microsoft Active Directory (AD):

Verification Method: Analysis

- compatible with the Enterprise Directory Services Service Interface Profile (SIP)
- access via Secure LDAP

Requirement ID: IKM-SRS-10

The IKM Tools shall integrate with the 'NIP Core' application layer consisting of a set of templates, services, metadata, content types and COTS: Layer 2 for automatic metadata tagging and Sparqube for cross-site look up

Verification Method: Analysis

Requirement ID: IKM-SRS-11

The IKM Tools shall support authentication from external Identity Provider (IdP) to allow the following authentication mechanisms:

Verification Method: Analysis

- Category I: NATO users who can authenticate to the Active Directory;
- Category II: NATO users who cannot authenticate to the Active Directory but can present a SAML token issued by a trusted Security Token Service;
- Category III: NATO users who cannot authenticate to the Active Directory and cannot present a SAML token issued by a trusted Security Token Service;
- Category IV: Non-NATO users (e.g. national users) who cannot present a SAML token issued by a trusted Security Token Service.

Requirement ID: IKM-SRS-12

The IKM Tools shall support Microsoft Active Directory Federated Services (ADFS) Trusted Identity Provider (TIP).

Verification Method: Analysis

Requirement ID: IKM-SRS-13

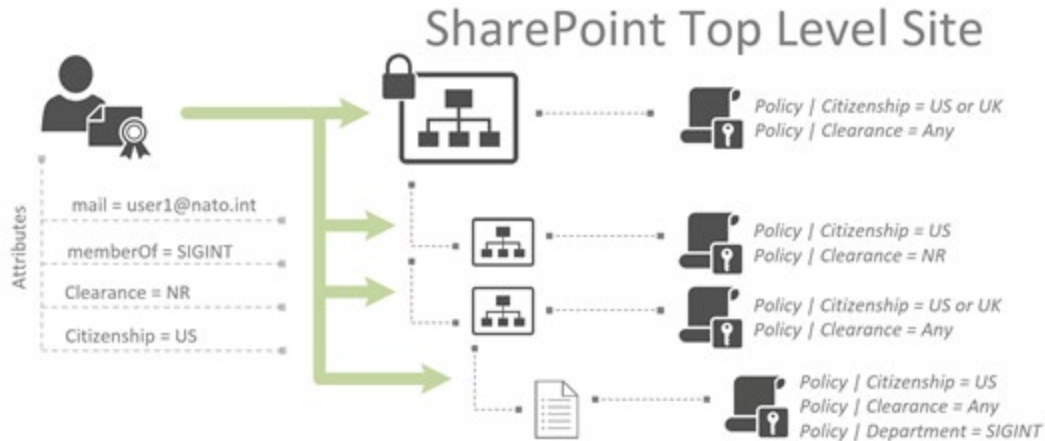
The IKM Tools shall be claims aware adhering to the Enterprise Single Sign On (ESSO) provided by ITM. So that users in a federated domain (e.g. using ADFS) can seamlessly access the IKM Tools without the need of re-authentication.

Verification Method: Test

Requirement ID: IKM-SRS-14

The Authorization mechanism shall relay on the SAML claim token attributes to access the web applications, Attribute Based Access Control (ABAC), and further coarse-grained by Role Based Access Control (RBAC) to access the Share Point sites. See following figure ITM Share Point External and Internal Authorization, see following diagram:

Verification Method: Test



Requirement ID: IKM-SRS-15

The IKM Tools shall support execution in logically separated environments within ON, PBN and Mission domains, so that two installations don't interfere with each other. Specifically for Training purposes, Mission Execution, Exercises and Experimentation.

Verification Method: Analysis

3.1.2 Migration

The ITM has performed a migration of the IAS Step 1 to the ITM centralized datacentres. This migration is in reality a “move” of the current IAS preserving the Share Point 2013 platform and topology configurations.

The IKM Tools is to finish the migration by updating the IAS Step 1 applications and dependant services to ITM Share Point along with the content migration (See section ref IAS Step 1 Upgrade).

Requirement ID: IKM-SRS-16

The IKM Tools shall upgrade the NIP application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed)

Verification Method: Test

Requirement ID: IKM-SRS-17

The IKM Tools shall upgrade the TT+ application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed)

Verification Method: Test

Requirement ID: IKM-SRS-18

The IKM Tools shall upgrade the EDMS application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed)

Verification Method: Test

Requirement ID: IKM-SRS-19

The IKM Tools shall upgrade the current NIP Core in Share Point 2013 to the ITM provided Share Point platform in ON, PBN and Standalone networks

Verification Method: Test

3.1.3 Presentation Services

These services provide the IKM Tools visual interaction with the user by depicting the IKM Tools system operations and results on web pages.

As described in the C3 Taxonomy:

“The Web Presentation Services allow combining rich content from different data sources into a single client web page or desktop, using a combination of Web 2.0 technologies such as HTML snippets, scripting code (JavaScript), on demand code (AJAX, JSON), web service calls and proprietary code.”

Therefore enables the user to customize the web pages by combining widgets (portlets, web parts and alike web components). The purpose is to achieve a better User eXperience (UX) via a flexible and standard User Interface. For example adhering to the UX aspects for a proper UX design:

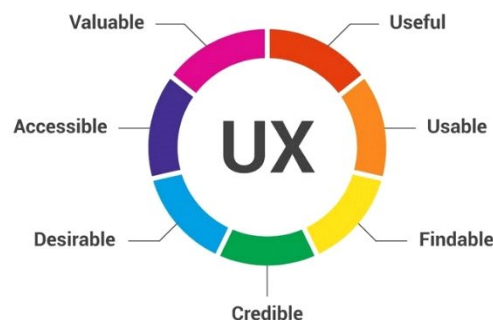


Figure 7 The 7 Factors that Influence User Experience (ref: Interaction Design Foundation)

The combination of widgets that Share Point offers facilitates this purpose. For the IKM Tools to deliver the required UX some more features need to be implemented following the industry standards.

Requirement ID: IKM-SRS-20

The IKM Tools shall provide the functionality to support the addition, update, deletion and visualisation of web widgets.

Verification Method: Test

Requirement ID: IKM-SRS-21

The IKM Tools shall provide the ability to customize the web widgets for the look and feel, security and similar functional aspects.

Verification Method: Test

Requirement ID: IKM-SRS-22

The IKM Tools shall be able to discover web widgets and make them available for use.

Verification Method: Inspection

Requirement ID: IKM-SRS-23

The IKM Tools shall provide functionality to manage the complete web widgets lifecycle. This includes deployment, modification, maintenance, un-deployment and archiving.

Verification Method: Analysis

Requirement ID: IKM-SRS-24

The IKM Tools shall provide inter-web widgets communication and remote web widgets communication.

Verification Method: Analysis

Requirement ID: IKM-SRS-25

The IKM Tools shall provide the functionality to render the visualization of the web widget according to user customization and user input.

Verification Method: Test

Requirement ID: IKM-SRS-26

The IKM Tools shall follow the Web 2.0 standards when applicable:

Verification Method: Analysis

- NISP Standard - HTML version 5.0 - "HyperText Markup Language (HTML), Version 5.0, Reference Specification"
- NISP Standard - RFC 2616: HTTP v1.1 - "HyperText Transfer Protocol (HTTP), version 1.1"
- NISP Standard - RSS 2.0 - "RSS 2.0 Specification"
- RFC 2318 - "The text/css Media Type"
- RFC 4287 - "The Atom Syndication Format"
- RFC 4329 - "Scripting Media Types"
- RFC 4627 - "The application/json Media Type for JavaScript Object Notation (JSON)"
- RFC 5023 - "The Atom Publishing Protocol"
- RFC 3986, 2005 - URI to identify resources
- CSS3 : CSS2.1 <http://www.w3.org/TR/CSS2/> , CSS Style Attributes, Media Queries Level 3, CSS Namespaces, Selectors Level 3, CSS Color Level 3

Requirement ID: IKM-SRS-27

The IKM Tools shall comply with the NATO Visual Identity Guidelines [ref. NATO Visual Identity Guidelines v. 3 (on-line)]

Verification Method: Inspection

Requirement ID: IKM-SRS-28

While it is advisable that the IKM Tools GUI should be not so far from the current IKM Tools so that the user sees a similar and familiar look and feel (e.g.: colors, layout and navigational behaviour), the Contractor shall propose a new modern UX and UI design that will be approved by the Purchaser during the Design Phase.

Verification Method: Inspection

Requirement ID: IKM-SRS-29

The IKM Tools shall provide all capability responsive for desktop devices and also for mobile devices (aka tablet and mobile phone).

Verification Method: Inspection

Requirement ID: IKM-SRS-30

The IKM Tools shall provide all capability optimized for the device is operating on.

Verification Method: Inspection

3.1.4 Web Services

In order to enhance the flexibility of the IKM applications a modular design needs to be considered to logically separate the applications from the underlying services they use.

This separation will guarantee the replacement of the applications or update of services without much impact between each other.

Requirement ID: IKM-SRS-31

For that whenever possible the contractor shall use web services instead of native calls which are tightly bounded to the particular version of the API. Specifically the following interfaces depicted in the Figure 8 Internal Interfaces:

Verification Method: Analysis

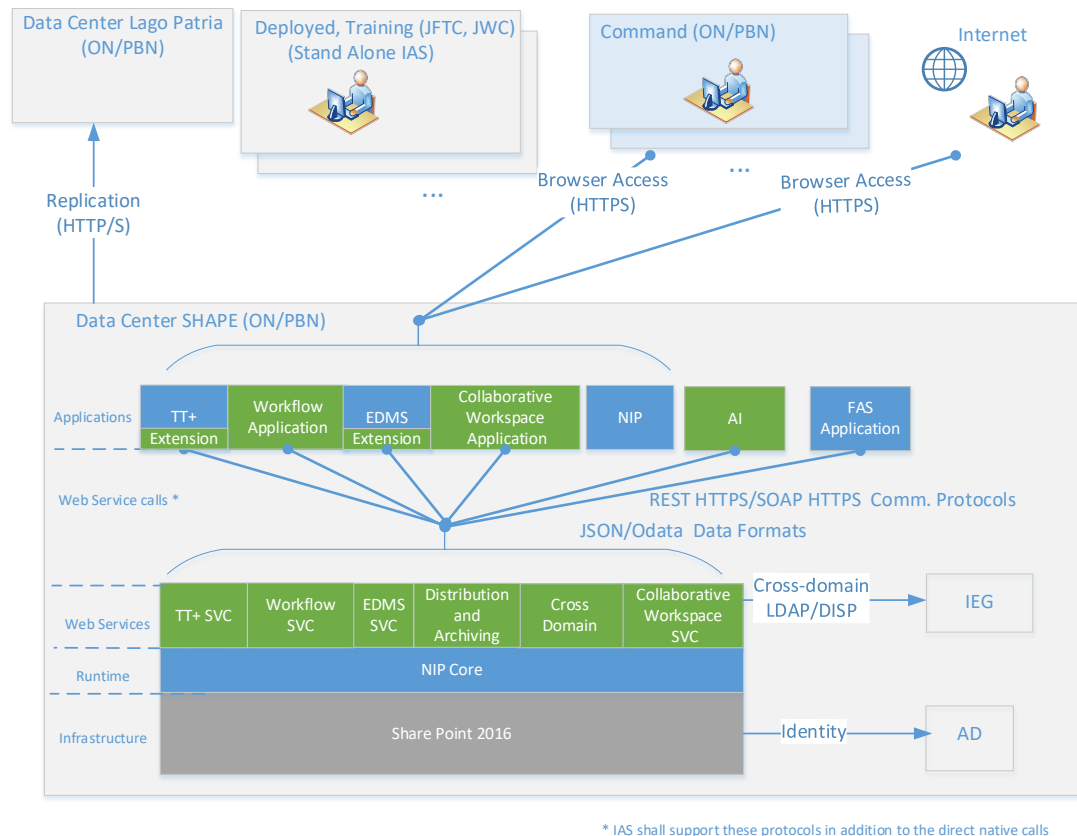


Figure 8 Internal Interfaces

Requirement ID: IKM-SRS-32

The IKM Tools Web Services using the REST Style when invoking other Web Services shall conform to the SIP for REST Messaging (see [NCIA AI 06.02.07, 2015]).

Verification Method: Analysis

Requirement ID: IKM-SRS-33

The IKM Tools Web Services using the SOAP Style when invoking other Web Services shall comply with the SIP for SOAP Messaging (see [NCIA AI 06.02.06, 2015]).

Verification Method: Analysis

Requirement ID: IKM-SRS-34

For each API Component the Contractor shall provide a “Web Service Reference Guide” to fully document the interface, including:

Verification Method: Analysis

- Server Application (the application that is exposing the service)
- Client Application (the application that is invoking the service)
- Authentication method
- Logging mechanism
- Mechanisms for securely invoking the API
- Available methods and functionality
 - Name
 - Description
 - Inputs
 - Name
 - Description
 - Type
 - Mandatory/Optional
 - Eventual enumeration values
 - Example of correct/incorrect values
 - Error messages
 - Elaboration rules

Requirement ID: IKM-SRS-35

The IKM Tools shall expose the APIs using open standards or widely accepted industry standards.

Verification Method: Analysis

Requirement ID: IKM-SRS-36

The IKM Tools API mechanism shall limit access of authenticated and Authorised Users/Systems to information products and workspaces required to perform the authorised function.

Verification Method: Analysis

Requirement ID: IKM-SRS-37

The IKM Tools GUI's shall make use of web services API to interact with a service whenever possible and when performance is not degraded below the accepted KPIs (see performance section).

Verification Method: Analysis

Requirement ID: IKM-SRS-38

The IKM Tools GUI's using web services API shall be designed to allow for future GUI enhancement or replacement with a modular and component design

Verification Method: Analysis

3.1.5 Search

The IKM Tools will leverage existing search services provided by ITM when present, improve the current IKM Tools Search service and also integrate with the SOA and IdM Platform Information Search Services.

On one hand the ITM Search Service uses the underpinning Share Point Search Engine as well as the IKM Tools (aka NIP Search) Service. As the ITM Search focuses on Share Point sources in ON and PBN domains, the NIP Search focuses on the Bi-SC domain in ON.

The intent is to consolidate all these search services into the IKM Tools Search service and managed independently.

Requirement ID: IKM-SRS-39

The IKM Tools Search service shall be upgraded as separated component (aka. dedicated Share Point Farm) so that the failure of other IKM Tools services doesn't impact this service and reverse..

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-39b

The IKM Tools Search service shall be capable to, at least, search 18 million items in ON and 7 million items in PBN, adhering to the prescribed KPIs (see NFR section Performance).

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-40

The IKM Tools shall provide search functionality leveraging the ITM Search capability if present by reusing existing services and extending them as needed, including the needed additional underlying Hardware and Software.

Verification Method: Analysis

Requirement ID: IKM-SRS-41

The IKM Tools shall be able to easily (with less than a working day) incorporate new information sources and extend the search index with the new data sources. The system uses OOTB SharePoint functions to ensure that the tool uses industry and FMN standards.

Verification Method: Analysis

Requirement ID: IKM-SRS-42

The IKM Tools shall provide the means for a user to discover the existence of information products to which they have access rights within the Enterprise.

Verification Method: Test

Requirement ID: IKM-SRS-43

The IKM Tools shall provide the means for a user to retrieve discovered information products to which they have access rights.

Verification Method: Test

Requirement ID: IKM-SRS-44

The IKM Tools shall provide the means to aggregate discovered information products by normalizing, de-duplicating and scoring them by relevance

Verification Method: Test

Requirement ID: IKM-SRS-45

The IKM Tools shall provide the means to sort discovered information products

Verification Method: Test

Requirement ID: IKM-SRS-46

The IKM Tools shall allow the user with means to specify search options, parameters and filters. At least filtered by: Command, Office, Keywords, Topics, Author, Date, Information Type and number of likes.

Verification Method: Test

Requirement ID: IKM-SRS-47

The IKM Tools shall allow the user to refine the search (faceted) based on one or more metadata fields (at least: topic, originating office, author, TT number, the command, the date, key word, area, sub area)

Verification Method: Test

On the other hand the SOA and IdM Information Search Services provides semantic search (i.e SPARQL queries search). The IKM Tools search will incorporate this service as another data source and integrate it as a federated service. For that it will pass on the search query in Natural Language to that service and collect back the results and present them to the user in the IKM Tools GUI:

Requirement ID: IKM-SRS-48

The IKM Tools shall provide the means to utilize natural language for the purposes of aggregating the discovered information products from the SOA and IdM Information Search Service

Verification Method: Test

Requirement ID: IKM-SRS-49

The IKM Tools shall provide with a Enterprise Directory workspace where to lists, search and browse users in the Enterprise with configurable views.

Verification Method: Test

Requirement ID: IKM-SRS-50

The IKM Tools Enterprise Search Directory shall enable to search users by: name, nationality, location, organizational unit and keywords

Verification Method: Test

Requirement ID: IKM-SRS-51

The IKM Tools Enterprise Search Directory shall list users depicting picture, name, organizational unit, location, nationality and job title, and allow filtering and ordering by name, nationality, organizational unit and location

Verification Method: Test

Requirement ID: IKM-SRS-52

The IKM Tools shall support searching physical media based on its metadata.

Verification Method: Test

3.1.6 Analytics

The Analytics functionality will provide a more precise, extended and relevant insights based on the information products (documents, articles...etc) reachable by the IKM Tools. It is targeted to the IKM arena and does not foresee the analysis of other data like FASes internal data types.

This functionality will provide analytical services to support the decision-making needs of the enterprise, using information produced by gathering, consolidating, cross-referencing and enhancing information from various sources. Different types of analytics can be applied: Descriptive analytics looks at past performance and understands that performance by mining historical data to look for the reasons behind past success or failure. Predictive analytics is an area of data mining that deals with extracting information from data and using it to predict trends and behaviour patterns. It is trying to answer the question what will happen. The Analytics Services enable the development, management, generation and dissemination of reports from identified information sources in a format most readily understood by the target reader and possibly based on specified templates.

The IKM Tools will support processing of structured and unstructured information, as streams or stored in persistent stores like databases.

There is a dedicated data scientist team that produces the analytic reports based on the Microsoft Power BI and KNIME tools. The Contractor will make available their output into the IKM Tools.

The IKM Tools will allow to publish analysed results in a variety of forms, as web content, MS Office documents and database stores

Requirement ID: IKM-SRS-53

The IKM Tools shall leverage the current Microsoft Power BI and KNIME technologies to provide the analytic services

Verification Method: Analysis

Requirement ID: IKM-SRS-54

The IKM Tools shall seamlessly integrate the analytic reports produced by the Power BI and KNIME tools, using the same look and feel, similar navigation and SSO without the need to re-authenticate.

Verification Method: Test

Requirement ID: IKM-SRS-55

The IKM Tools shall allow to interact with the published analytic reports as per user permissions, so that users can drill down, see hints and extended graphical information, export reports to Excel, Power Point and CSV, and collaborate with other users (sharing or analyse them in Excel).

Verification Method: Test

Requirement ID: IKM-SRS-56

The IKM Tools shall allow users to analyse the use of individual information items and documents

Verification Method: Test

Requirement ID: IKM-SRS-57

The IKM Tools shall allow users to analyse and display large amounts of data. The IKM User creates reports using the analysis tools. Then the IKM user reads the reports and identifies trends and patterns to improve NATO business processes

Verification Method: Test

Requirement ID: IKM-SRS-58

The IKM Tools shall allow users to present the results of the analysis in a wide variety of ways so that the reports are presented in the most suitable format for user interaction: as tables, charts, diagrams, video and images.

Verification Method: Test

Requirement ID: IKM-SRS-59

The IKM Tools shall allow users to analyse both structured and unstructured data.

Verification Method: Test

Requirement ID: IKM-SRS-60

The IKM Tools shall allow users to store and reuse analysis that they have already been performed, either on the same or different sources of data.

Verification Method: Test

3.1.7 Artificial Intelligence (AI)

The AI functionality will apply AI techniques and technology to better categorize, organize and distribute information, as well as to enhance the knowledge management of IKM Tools information products and their quality. Resulting in a higher degree of accuracy of information products metadata.

This functionality will incorporate the already existing AI Felix tool capabilities, a tool already developed using .NET, Python, MS SQL Server (a sample video is available for the Contractor).

Initially the AI will implement one process, Command Read Board (CRB) but with the ability to add more in the future with minimal configuration.

Requirement ID: IKM-SRS-AI-1

The AI shall implement the CRB process. This process entails reading emails from a users' dedicated email box in MS Exchange, extract the information products and process them for metadata categorization, finally to send them by email to the inferred addressee.

Verification Method: Test

3.1.7.1 Integration

Requirement ID: IKM-SRS-AI-2

The AI shall be integrated in the IKM Tools as any other tools and services (TT+, EDMS, NIP) with a seamless GUI User Experience (UX) when navigating and operating it (i.e.: using Add-in SPS framework)

Verification Method: Inspection

Requirement ID: IKM-SRS-AI-3

The AI shall integrate with the IKM Tools data model for retrieving metadata definitions and metadata values. For instance acceding to the IKM Tools taxonomies, managed metadata and content types.

Verification Method: Inspection

Requirement ID: IKM-SRS-AI-4

The AI shall as well integrate with the same IKM Tools user access control mechanisms (a.k.a. ADFS and Share Point groups).

Verification Method: Test

3.1.7.2 Generic

Requirement ID: IKM-SRS-AI-5

The AI shall provide high availability and fault tolerance in line with IKM Tools and the KPI's described in the NFR section 4.

Verification Method: Analysis

Requirement ID: IKM-SRS-AI-6

The AI shall train the Machine Learning algorithms at least once a week.

Verification Method: Analysis

Requirement ID: IKM-SRS-AI-7

The AI shall have at least the accuracy levels for metadata inference stated in following table:

Metadata Field		Accuracy level
Title		89%
Date	Day	90%
	Month	90%
	Year	95%
Received From		75%
Reference Number		93%
Classification		99%
Publish to		70%
Topics		60%
Keywords		60%
Document type		90%
Silence End Date		80%
COM/DCOS/CGA		60%
ACOS		60%
NMR		60%

Table 1 AI metadata accuracy levels

Verification Method: Test

3.1.7.3 Command Read Board (CRB) process

This process aims to help a designated user with the processing of incoming mail to the Command in order to categorize information products, mainly documents, and route them to the appropriate addressee/Directorate.

Requirement ID: IKM-SRS-AI-8

AI shall implement at least the following steps:

- IP read
- IP extraction
- IP processing or categorization
- IP user validation
- IP send to addressee

Verification Method: Analysis

3.1.7.3.1 IP read

Requirement ID: IKM-SRS-AI-9

AI shall be able to read the incoming emails from the dedicated and authorized MS Exchange mailbox

Verification Method: Test

Requirement ID: IKM-SRS-AI-10

AI shall be able to download/read IP from EDMS and TT+

Verification Method: Test

3.1.7.3.2 IP Extraction

Requirement ID: IKM-SRS-AI-11

AI shall extract from the email at least the following IP types: .pdf, .docx, .pptx, .xlsx

Verification Method: Test

Requirement ID: IKM-SRS-AI-12

AI shall extract readable content from scanned IP using Optical Character Recognition (OCR) (i.e.: reading a scanned PDF document).

Verification Method: Test

3.1.7.3.3 IP processing or categorization

Requirement ID: IKM-SRS-AI-13

AI shall have a dedicated tab/page Document Overview for this processing displaying the following incoming correspondence IPs:

- All incoming correspondence for current day.
- All incoming correspondence from previous days whose status is not green.

Verification Method: Test

Requirement ID: IKM-SRS-AI-14

AI shall automatically remove from the list all IPs with green status at 0000 local time.

Verification Method: Test

Requirement ID: IKM-SRS-AI-15

The Document Overview Tab shall have a Refresh and a Check the IPs buttons, to re-read IPs from sources and to validate the IP respectively.

Verification Method: Test

Requirement ID: IKM-SRS-AI-16

The tool shall have a traffic light system set up to show the colours for each status of the IP:

- Red: User has not reviewed that document.
- Amber: User has edited some metadata within that document but not completed the review.
- Blue: User has completed the first review (Registry)
- Green: User has completed the final review. The document is then uploaded into EDMS in the library pre-selected by the user. If the document is a tasker.

Verification Method: Inspection

Requirement ID: IKM-SRS-AI-17

AI shall use Machine Learning to infer at least the following metadata from an IP: Title, Filename, Received From, Security Classification, Reference Number, Type of Document (Regular, Silence, Action Sheet, Paired Action Sheet), Publish to Other Departments, Topics, Keywords, Silence End Date, Silence Document Corresponding Reference Number, Date, [Determine if leads to an action], [predict all relevant tasks derived from the document], Action Sheet Paired Reference Number, Action Owner, Task Owner, Task Lead (ACT, ACO,

Both, Neither), Pages Tasks are on, Task Priority Level, Task description, Task Target Completion Date, NMR, COM/DCOS/CGA, ACOS.

Verification Method: Test

Requirement ID: IKM-SRS-AI-18

AI shall be able to determine whether the IP is a task and infer the following metadata: Create Date, Target Completion Date, Received From, Task Owner, Security Classification, Reference Number and SC Lead

Verification Method: Test

Requirement ID: IKM-SRS-AI-19

AI shall present the IP's to the user for manually start the processing (i.e.: button click)

Verification Method: Test

Requirement ID: IKM-SRS-AI-20

AI shall have a dedicated tab/page Detailed Document for user validation.

Verification Method: Inspection

Requirement ID: IKM-SRS-AI-21

AI shall allow the user to validate the IP inferred metadata

Verification Method: Test

Requirement ID: IKM-SRS-AI-22

The Detailed Document Tab shall have a vertical split screen that displays the metadata results on the left and the incoming document viewer on the right. The document viewer shall have the following functionalities:

- Scroll up and down
- Zoom in and out
- Select and copy text
- Print the document.
- The user shall be able to customize the proportion of the vertical split, with the default proportion being 50/50.

Verification Method: Test

Requirement ID: IKM-SRS-AI-23

The Detailed Document Tab shall present the metadata fields in pairs:

- Top: metadata field inferred by the machine learning algorithms.
- Bottom: metadata field can be edited by the user. By default, it is initialized equal as the value inferred by the tool.

Verification Method: Inspection

Requirement ID: IKM-SRS-AI-24

The Detailed Document Tab shall have these buttons: Save, Previous, Next, Registry and Complete:

- The Save button shall save all work that has been done in the database.
- The Previous button shall display the previous IP. If the save button has not been clicked since the last action, the tool shall prompt the user whether he/she wants to save the progress on that IP.
- The Next button shall display the next IP. If the save button has not been clicked since the last action, the tool shall prompt the user whether he/she wants to save the progress on that IP.
- The Registry button shall save the progress and make the traffic light color change to blue. This indicates that the user has conducted the first review.
- The Complete button shall perform the following functions:
 - Save the progress on the IP in the database.
 - Upload the document to the predefined EDMS library
 - Create a Draft tasker if the document is considered a task
 - Change the traffic light color to green once the actions Upload and Create are successfully completed. This indicates that the user has conducted the last review of the document.

Verification Method: Test

3.1.7.3.4 IP send to addressee

Requirement ID: IKM-SRS-AI-25

AI shall be able to select the EDMS library where to upload the IP

Verification Method: Test

Requirement ID: IKM-SRS-AI-26

The tool shall identify duplicate IPs and prompt the user to decide whether to proceed with uploading to the pre-selected EDMS library or not

Verification Method: Test

Requirement ID: IKM-SRS-AI-27

AI shall send the IP to the inferred addressee's email

Verification Method: Test

3.2 IAS Step 1 Upgrade

The IAS Step 1 is responsible for moving the original IAS into the ITM infrastructure by transferring the IAS underlying virtual machines (including the IAS EDMS/TT+ applications) into the ITM HW infrastructure.

This means to continue using the SPS 2013 platform and current NS AIS domain.

Requirement ID: IKM-SRS-61

In this IAS Step 2 the Contractor shall upgrade to the ITM Share Point platform. By upgrading the IKM Tools, deploying them into the ITM Share Point platform along with the respective data, services and into the target security domains: NS for the IKM Tools in ON, NR for the IKM Tools in PBN.

Verification Method: Test

See the following diagram:

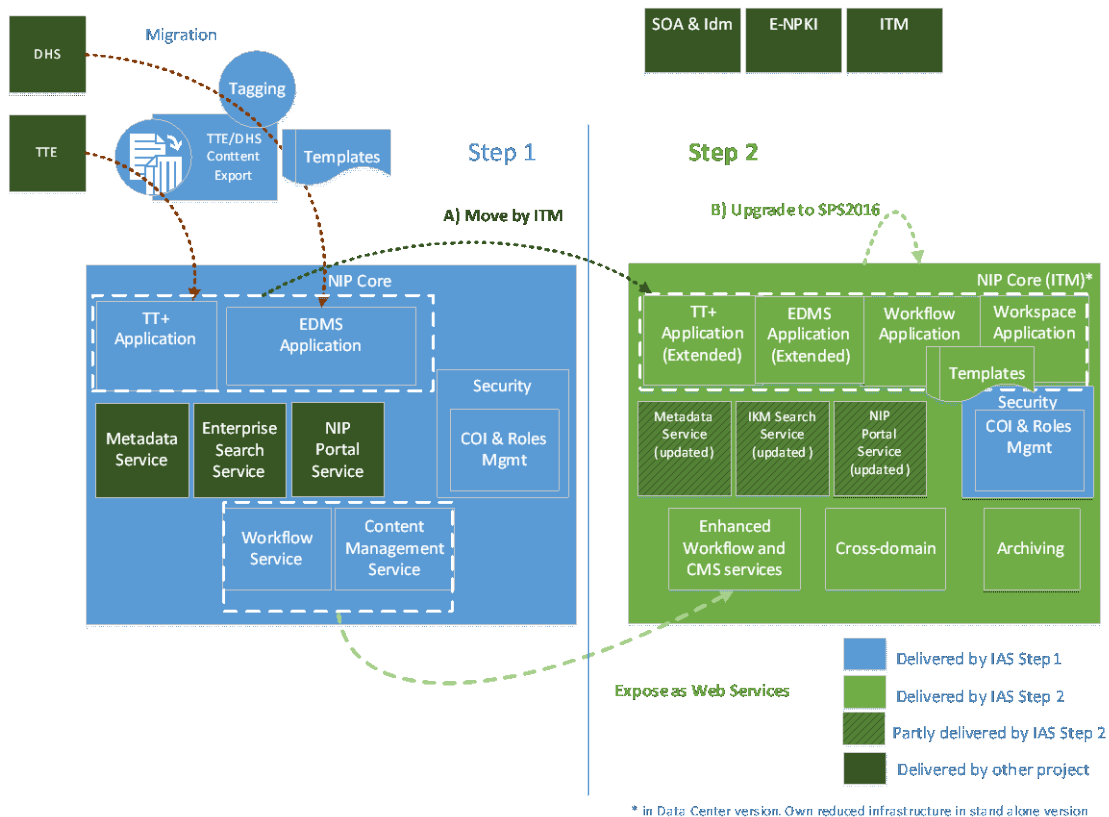


Figure 9 IAS Step 1 Upgrade and Migration

3.3 Workflow

3.3.1 Definition

The workflow definition is its configuration in the design phase to set up the workflow steps, activities, roles and actors. This phase occurs when new workflow needs to be set up but also for existing workflows that need modifications. Normally happens in a development environment and is executed by the Workflow Designer role. This role has access to all the needed tools to graphically set tasks and decision points, identify actors and flows between activities. The result is a workflow definition or a template that can be used for subsequent workflows definitions.

Once the definition is set, it is tested thoroughly and eventually published into the IKM Tools after Service Owner approval.

3.3.1.1 Modelling

As the first action for a designer Modelling involves the retrieving of the workflow requirements generally obtained by analysing existing business flows and interviewing participants.

These requirements are then “translated” into the workflow model by the Workflow Designer by using the IKM Tools workflow design tool. In here the Workflow Designer can select actions, flows, activities and other related components and configure them, by connecting them with arrows as representing the process flow.

Requirement ID: IKM-SRS-62

The IKM Tools Workflow shall be available on the Operation Network (ON) and on the Protected Business Network (PBN). See SOW ANNEX D for the complete list of sites.

Verification Method: Inspection

Requirement ID: IKM-SRS-63

The IKM Tools shall allow the user to manage the workflow definition with operations: create, delete, modify, export, import, backup and restore.

Verification Method: Test

Requirement ID: IKM-SRS-64

The IKM Tools shall enable the creation of workflows, its steps, including Exception, Alternative and Extension paths; defining the activities/tasks, their inputs, actors (users/services), conditions (triggers, rules, etc.) under which they will operate and their expected outputs.

Verification Method: Test

Requirement ID: IKM-SRS-65

The IKM Tools shall allow to model workflows routing: parallel, sequential, forks and reverse flows.

Verification Method: Test

Requirement ID: IKM-SRS-66

The IKM Tools shall provide a workflow functionality for document processes, including but not limited to: item approval, collect signatures, get feedback, document tracking, content publishing and document archiving and distribution

Verification Method: Analysis

Requirement ID: IKM-SRS-67

The IKM Tools shall provide a workflow functionality applicable at least to the following information products: documents, events, images, video, audio, list items and related IKM information products

Verification Method: Analysis

Requirement ID: IKM-SRS-68

The IKM Tools shall allow to scope workflows to Sites, Lists and Items

Verification Method: Analysis

Requirement ID: IKM-SRS-69

The IKM Tools shall provide the means to manage and reuse data structures (workflow templates, forms templates, documents, etc.) for use within another workflow

Verification Method: Test

Requirement ID: IKM-SRS-70

The IKM Tools shall include a graphical workflow modelling, composition and orchestration with other integrated and federated services or workflows; and conforming with the standard Business Process Model and Notation (BPMN).

Verification Method: Inspection

Requirement ID: IKM-SRS-71

The IKM Tools shall support the following workflows patterns:

Verification Method: Analysis

- Digitalized Process: workflows defined from external analogue source (i.e.: paper)
- Intelligence Business Operations (IBO): workflows based on analytics (part of IKM Tools) and decision management technologies integration that produces a transaction

Requirement ID: IKM-SRS-72

The IKM Tools shall allow the user to create, delete and modify an activity.

Verification Method: Test

Requirement ID: IKM-SRS-73

The IKM Tools shall allow the user to create, delete and modify a decision point.

Verification Method: Test

Requirement ID: IKM-SRS-74

The IKM Tools shall allow the user to order and connect activities and decision points as linear, parallel or nested flows.

Verification Method: Test

Requirement ID: IKM-SRS-75

The IKM Tools shall allow the user to drill down into the details about a workflow and activity.

Verification Method: Test

Requirement ID: IKM-SRS-76

The IKM Tools shall allow the user to select events that trigger the workflow, including but not limited to:

Verification Method: Analysis

- Item added, modified or deleted
- Item status changed

Requirement ID: IKM-SRS-77

The IKM Tools shall allow the user to select the triggered action mode: manual by the user or automatic by an event

Verification Method: Analysis

Requirement ID: IKM-SRS-78

The IKM Tools shall allow the user to select the means by which an event is notified:

Verification Method: Test

- by the GUI as a user interaction
- by a web service call
- by receiving an E-mail
- by adding an item in a folder in the File System
- by the IKM Tools workspace or workflow

Requirement ID: IKM-SRS-79

The IKM Tools shall provide the means to define and manage roles of users and services, their access and participation within a workflow and the secure execution of that workflow. The secured execution includes the access to the workflow activities as well as its related information products (i.e.: workflow documents)

Verification Method: Analysis

Requirement ID: IKM-SRS-80

The IKM Tools shall allow workflows and dependant information (information products, participants and alike) to be indexed by the NATO Search so that they are visible to the Enterprise Users following the concept of "Responsibility to Share", and allow to restrict sensitive workflows to a close hold group of participants (i.e.: public workflow attribute to allow all users read access and close-hold attribute to define a limited group of users).

Verification Method: Test

Requirement ID: IKM-SRS-81

The IKM Wools shall allow users to model business processes for repeated execution as "workflows" so that after workflow completion users can re-start the workflow again from the beginning in an iterative manner.

Verification Method: Test

3.3.1.2 Simulation

After the workflow definition is completed the simulation phase helps to verify the workflow adequacy and trustfulness against the business requirements and validate that is fit for purpose and error free.

The simulation needs to represent a realistic workload in terms of user interactions and information products outputs. The purpose is to reassure it will operate as expected in the real scenario when is published to production environment.

Requirement ID: IKM-SRS-82

The IKM Tools shall support the simulation and validation of workflows

Verification Method: Test

Requirement ID: IKM-SRS-83

The IKM Tools shall allow workflow processes improvement by iteratively Design, Model, Execute, Monitor and Optimize workflows

Verification Method: Analysis

Requirement ID: IKM-SRS-84

The IKM Tools shall support the profiling of workflows and consumers (users and services) using metadata and supporting taxonomies (controlled, semi-controlled and open), ontologies, data models and standard data elements. This includes versioning of workflows and the state of execution of specific instances.

Verification Method: Analysis

Requirement ID: IKM-SRS-85

The IKM Tools shall provide a GUI for debugging workflows. The GUI shall allow the user to set breaks points in activities and related script code, view workflow status variables, continue the process, step-in inside a sub-activity and stop the workflow.

Verification Method: Test

3.3.2 Processing

This phase occurs during the workflow operational usage. The day to day workflow execution is described here.

3.3.2.1 Rules

The rules are the governing actions a workflow is adhered to such ways of executing steps, scripts and activities. The rules specify what a workflow can do on a given time and restraint to the workflow definition. The Workflow Engine applies the rules by reading an input, processing it and producing an output.

Requirement ID: IKM-SRS-86

The IKM Tools shall allow the user to initiate a workflow according to the workflow definition.

Verification Method: Test

Requirement ID: IKM-SRS-87

The IKM Tools shall automatically update the new workflow instances upon a workflow definition change, without affecting the current workflow instances being executed.

Verification Method: Test

Requirement ID: IKM-SRS-88

The IKM Tools shall enable activities to run code (Scripts) to extend the activity's actions

Verification Method: Test

Requirement ID: IKM-SRS-89

The IKM Tools shall allow the user to record activity status.

Verification Method: Test

Requirement ID: IKM-SRS-90

The IKM Tools shall allow the user to delegate an activity to another user according to the workflow definition and set permissions

Verification Method: Test

Requirement ID: IKM-SRS-91

The IKM Tools shall allow the user to take over an activity from another user according to the workflow definition and set permissions

Verification Method: Test

Requirement ID: IKM-SRS-92

The IKM Tools shall allow to preserve the current execution state in case of an interruption and resume the execution without any data and status loss.

Verification Method: Test

3.3.2.2 Notifications

An important aspect of a workflow is the user's participation and awareness of the workflow status. The notifications mechanisms allows to send information to the participants of a workflow for status updates, to remind user's needed action or simply for information.

Although normally email is a standard method other methods can also be provided such as SMS or web announcements in a portal.

Requirement ID: IKM-SRS-93

The IKM Tools shall allow the user to manage personal workflow notifications (read, register and un-register) with parameters such as frequency, delivery methods, and triggered events

Verification Method: Test

Requirement ID: IKM-SRS-94

The IKM Tools shall allow an authorized user to manage (assign, remove) user's workflow notifications (read, register and un-register) with parameters such as frequency, delivery methods, and triggered events

Verification Method: Test

Requirement ID: IKM-SRS-95

The IKM Tools shall allow the user to filter notifications he receives by at least the following parameters:

Verification Method: Test

- Workflow actions
- Frequency
- Notification format: email, SMS or alert message in IKM Tools GUI.

Requirement ID: IKM-SRS-96

The IKM Tools shall be able to generate notifications of workflow status changes to the participants.

Verification Method: Test

Requirement ID: IKM-SRS-97

The IKM Tools shall automatically inform the participant for an activity that a new activity has to be performed.

Verification Method: Test

Requirement ID: IKM-SRS-98

The IKM Tools shall automatically inform the participant for an activity that a related decision has been made.

Verification Method: Test

Requirement ID: IKM-SRS-99

The IKM Tools shall automatically inform the user for any definition changes in the workflow he designed

Verification Method: Test

Requirement ID: IKM-SRS-100

The IKM Tools shall provide the mechanism to send SMS notifications to participants being individual users or a group of users and according to the defined notification parameters

Verification Method: Test

Requirement ID: IKM-SRS-101

The IKM Tools shall provide the mechanism to send e-mail notifications to participants being individual users or a group of users and according to the defined notification parameters

Verification Method: Test

Requirement ID: IKM-SRS-102

The IKM Tools shall allow to customize the notification message content: text, links and other information so that it is personalized and adapted to the workflow and the target receiver audience. This customization can be easily changed by the authorized user and associated to different workflow steps (i.e.: upon approval the participant receives "activity 2 approved by the manager with message: all good").

Verification Method: Test

Requirement ID: IKM-SRS-103

The IKM Tools shall be able to send email notifications with the participant's required responses enabled in the message so that participant can directly select his response without the need to go to the IKM Tools Workflow GUI, that is, within the user's email client (i.e.: participant receives an email message in Outlook containing action buttons for Approve, Reject responses).

Verification Method: Test

3.3.2.3 Annotations

Annotations is a feature to enrich the workflow understanding by adding side notes into its description, that is, during the definition phase.

But also serves to complement the workflow decisions by explaining why a decision was taken in a decision point and therefore acknowledge the rationale.

Requirement ID: IKM-SRS-104

The IKM Tools shall allow the user to annotate a workflow or an activity with notes, links, files, images and/or keywords, at workflow definition and during workflow execution (instance)

Verification Method: Test

Requirement ID: IKM-SRS-105

The IKM Tools shall allow the user to manage annotations: add, delete, modify and define keywords.

Verification Method: Test

Requirement ID: IKM-SRS-106

The IKM Tools shall allow the user to preserve (record and store) annotations about a decision (i.e.: keep history)

Verification Method: Test

3.3.3 Services

3.3.3.1 Web Services

Requirement ID: IKM-SRS-107

The IKM Tools shall provide an open standard workflow functionality API for FASes integration (i.e. based on OData), so that FASes can perform web service calls to the IKM Workflow. Specifically integration with Microsoft Power BI for workflow analytics reporting.

Verification Method: Analysis

3.3.3.2 Collaboration Services

Requirement ID: IKM-SRS-108

The IKM Tools shall provide the means to distribute information products to and from participants within a workflow instance and their collaborative environment over integrated and federated services.

Verification Method: Test

Requirement ID: IKM-SRS-109

The IKM Tools shall support a collaborative environment and means for check-in/out, versioning, storage and share in Collaborative Workspace and import and export of workflows information.

Verification Method: Test

Requirement ID: IKM-SRS-110

The IKM Tools shall integrate with Share Point framework for creating, moving, modifying and deleting items in a list, for sending and receiving items to workspaces and for adding and changing items metadata. The integration consists of user interaction (access, operations) via the Share Point GUI and it's underlying services.

Verification Method: Test

Requirement ID: IKM-SRS-111

The IKM Tools shall provide a workflow functionality integrated with the following IKM portals if available: NIP Portal, EDMS and TT+. So that the activities and information products of the workflows can seamlessly interact with these applications as they do with the Share Point framework

Verification Method: Test

Requirement ID: IKM-SRS-112

The IKM Tools shall provide a search capability on the workflows' content: descriptions, status, activities, participants, keywords and other metadata, leveraging the IKM Search if available.

Verification Method: Test

3.3.3.3 Presentation Services

Requirement ID: IKM-SRS-113

The IKM Tools shall offer a web Graphical User Interface (GUI) for all the user interactions: participate, design, monitor, debug and report workflows and activities.

Verification Method: Inspection

Requirement ID: IKM-SRS-114

The IKM Tools workflow web GUI shall allow the user to graphically design workflows with elements representing activities, flows, decision points, actions and all necessary components of the workflow.

Verification Method: Inspection

Requirement ID: IKM-SRS-115

The IKM Tools workflow web GUI shall allow the user to interact with the workflow via rich data collection forms, that is with form controls supporting photos, geo location, maps, barcodes, signatures and alike, adhering to the standards [ref HTML5, CSS...]

Verification Method: Analysis

Requirement ID: IKM-SRS-116

The IKM Tools workflow forms shall allow validation of user's inputs by field types: phone, email, country and other defined Managed Metadata in IKM Tools whenever possible. And to set mandatory filled fields visually displayed (i.e.: with a red star).

Verification Method: Test

Requirement ID: IKM-SRS-117

The IKM Tools shall allow configurable dashboards to present the information product's metadata and workflow's information in multiple views

Verification Method: Analysis

Requirement ID: IKM-SRS-118

The IKM Tools workflow forms shall allow to connect to back end Authoritative Datasources (AD), being in the Enterprise, in the Federation or in the Cloud, to

retrieve information and seamlessly using the needed authorization method (i.e.: use ADFS if user information is in a federation).

Verification Method: Test

Requirement ID: IKM-SRS-119

The IKM Tools shall visualize the workflow status with indicators to at least depict: workflow Defined (not initiated), workflow In-progress, workflow Paused, workflow Error and workflow Completed

Verification Method: Inspection

Requirement ID: IKM-SRS-120

The IKM Tools shall allow to show the workflow status and dashboard reports as separate components views so that can be re-used and placed in different IKM Tools sites and web pages (i.e.: a report web part connected to a workflow that can be placed in multiple pages).

Verification Method: Test

Requirement ID: IKM-SRS-121

The IKM Tools shall allow to create views based on IP metadata (i.e. documents with tagged 'likes').

Verification Method: Test

3.3.4 Management

In order to be able to properly control a workflow lifecycle a management feature is needed. It consists of all activities surrounding a workflow administration. The purpose is to ensure the proper execution, with the correct participants and information inputs, the Workflow Manager role overviews this with the help of the IKM Tools monitoring and alerting features. Takes proper actions and also informs the Service Owner for service deviations in terms of performance, availability and other parameters set in the SLA.

Requirement ID: IKM-SRS-122

The IKM Tools shall offer a comprehensive framework to graphically identify issues and actions and also to take O&M actions such as exporting or importing workflow definitions, maintaining the workflow versions and auditability.

Verification Method: Inspection

3.3.4.1 Logging

As part of the Management feature the logging helps to audit the workflow steps for future forensic analysis but also for Continuous Service Improvement (CSI) of the workflow itself.

Logging has to be detailed enough to capture all the execution steps, with special emphasis in error detecting and prevention via warning logs.

Requirement ID: IKM-SRS-123

The IKM Tools shall log workflow execution events categorized so that they can be easily identified at least as information, warning and error.

Verification Method: Analysis

Requirement ID: IKM-SRS-124

The IKM Tools logs shall be accessible by an authorized user via the IKM Tools GUI (i.e.: logs as a list with restricted access)

Verification Method: Inspection

Requirement ID: IKM-SRS-125

The IKM Tools shall keep the history of the changes that occurred to the workflow with metadata, including but not limited to: name of the user, date, time, nature of the change.

Verification Method: Inspection

Requirement ID: IKM-SRS-126

The IKM Tools shall provide statistical and auditing capabilities over the workflow instances for NATO governance and policy compliance purposes [ref NIMP AC/322-D(2017)0027] and for workflow optimization.

Verification Method: Test

3.3.4.2 Reporting

This feature permits to gather workflow information in formats that are suitable for the users to depict multiple aspects of the workflow instances. Reports are normally established by the Workflow Designer and triggered automatically by the IKM Tools or manually by the user via the IKM Tools GUI.

Reporting allows to collate workflow information on various form and perform some basic analysis to produce a visual output being a list of events, some performance diagrams or a summary of the entire workflow status.

Requirement ID: IKM-SRS-127

The IKM Tools shall report information associated with workflows, their instances and related collaborative environments.

Verification Method: Inspection

Requirement ID: IKM-SRS-128

The IKM Tools workflows reports shall at least include the following report types: Workflow Overview listing all instances, Activity Status showing activities execution times, and User usage reports depicting user's contributions in workflows.

Verification Method: Inspection

Requirement ID: IKM-SRS-129

The IKM Tools workflows reports shall be in the most suitable form for each report type: graphs, diagrams, tables or texts

Verification Method: Analysis

Requirement ID: IKM-SRS-130

The IKM Tools workflow reports shall be produced in widely accepted data formats, specifically compatible with Microsoft Excel for tables and Microsoft Word for texts or diagrams.

Verification Method: Test

3.3.4.3 Administration

Administering a workflow means to warrant it works appropriately and that any modifications asked by a user or taken by the Workflow Administrator is applied and executed.

Exporting, importing and backing up workflows are necessary actions to preserve proper O&M and execution control. Also to allow to expand the IKM Tools functionality by incorporating new workflows defined elsewhere that can be applied to the IKM Tools.

Also entails to un-lock workflows in the event of errors, misuse or just speed it up by enforcing steps completion or by delegating activities to other users.

Requirement ID: IKM-SRS-131

The IKM Tools shall support the maintenance and sustainment of workflows, their execution (instances) and exception handling in accordance with a defined Model, their content and of their supporting systems (in conjunction with SMC and IA services) throughout the workflow and instance lifecycles.

Verification Method: Test

Requirement ID: IKM-SRS-132

The IKM Tools shall allow the user to export workflows with a button-click and in a format that can be easily stored, interpret by a user and imported back to the IKM Tools

Verification Method: Test

Requirement ID: IKM-SRS-133

The IKM Tools shall allow workflows to be backed-up and archived recording the: workflow id, workflow name, workflow definition, workflow version, workflow status, back up date time and user who triggered the backup.

Verification Method: Test

Requirement ID: IKM-SRS-134

The IKM Tools shall allow the user to manage activities as components of the workflow definition.

Verification Method: Test

Requirement ID: IKM-SRS-135

The IKM Tools shall allow authorized users to un-lock activities by superseding the participant, discarding participants' action or by delegating the action to another participant.

Verification Method: Test

Requirement ID: IKM-SRS-136

The IKM Tools shall allow the user to manage the workflow execution by start, pause, cancel and monitor the workflow instances

Verification Method: Analysis

Requirement ID: IKM-SRS-137

The IKM Tools shall allow the user to manage (Create, Read, Update and Delete) activities.

Verification Method: Test

Requirement ID: IKM-SRS-138

The IKM Tools shall allow the user to manage decision points.

Verification Method: Test

Requirement ID: IKM-SRS-139

The IKM Tools shall allow the user to change the decision status.

Verification Method: Test

3.3.5 TT+ extension

The IAS Step 1 project delivered the TT+ application with some missing features that were decided to include in the next IKM Tools project.

This features are very specific and are meant to accurately make TT+ fit for purpose for the Commands.

Therefore they are to be included in the existing TT+ application and not in the workflow application.

These are specifically captured in the following requirements:

Requirement ID: IKM-SRS-140

TT+ shall provide a configurable Prioritisation indicator on Taskers.

A Priority column shall be added to enable Tasker prioritisation.

Default values: Urgent, High, Routine

This priority column shall be configurable (i.e. possibility to amend default values or add new ones) and associated to a configurable Traffic Light indicator (an icon), i.e. it shall be possible to change that icon. The TTE icons shall be reused as default icons.

In addition, this Traffic Light indicator shall have a tooltip that provides the actual Priority in full text (i.e. "Urgent", "High", "Routine"). When the user selects the prioritisation of the tasker the Tasker priority is displayed with arrows (up for high, down for low and no arrow for normal). Tasker times (new for issued in the last 24 hours, green until 80% of the suspense date had expired, yellow for when 20% remains, red for tasker overdue).

Verification Method: Test

Requirement ID: IKM-SRS-141

TT+ shall provide a configurable "Office inbox".

The Office inbox provides a list of all actions assigned to a specific office.

The user shall be able to flip through offices inboxes seamlessly.

The TTE Office inbox shall be used as the reference.

Verification Method: Test

Requirement ID: IKM-SRS-142

TT+ shall allow a user with appropriate permissions to create a Tasker from a document stored in EDMS:

When the EDMS is configured to be connected to TT+, the user shall be able to create a Tasker from any document. The User must have the appropriate permissions to create a tasker.

The tasker hence created shall retain the reference to the "initiating document" by simply storing a link under the 'Documents' tab.

Verification Method: Test

Requirement ID: IKM-SRS-143

TT+ shall allow external services to store the URL of the tasker initiation document. (Create field to foresee previous requirement):

When workspace is created (or links list in workspace), add link to the initiating document

Verification Method: Test

Requirement ID: IKM-SRS-144

TT+ shall provide a configurable "My tasks page":

The 'My tasks' page shall provide a list of all the incomplete tasks that are assigned to a user (same approach as office inbox, with configuration list).

The user has a my tasks view which is solely for the logged on user. The user can sort the view of taskers by priority & date. (aka: TT+ 'My Tasks' shall be used as the reference).

Verification Method: Test

Requirement ID: IKM-SRS-145

The user shall be able to create and manage a favourite users list as follows:

Verification Method: Test

- to add users from Active Directory user account or groups, and SharePoint groups.
- to remove users
- to sync users with AD and grey out the deleted users accounts (non present users).

Requirement ID: IKM-SRS-146

TT+ sub tasking shall leverage Favourite users:

When creating / editing a task (sub task) the user shall be able to cherry-pick amongst her favourite users as well as enter new AD user accounts manually. TT+ shall rely on an extended people picker control.

See the TTE 'sub tasking' functionality as the reference.

In addition, deleted ad account accounts should be greyed out (+ no checkbox)

Verification Method: Test

Requirement ID: IKM-SRS-147

TT+ 'adding a member' shall leverage Favourite users:

When adding a new member to a Tasker, the user shall be able to cherry-pick amongst her favourite users as well as enter new AD user accounts manually. TT+ shall rely on an extended people picker control.

See the TTE 'add Users' functionality under 'Members' tab as the reference.

In addition, deleted ad account accounts should be greyed out (+ no checkbox)

Verification Method: Test

Requirement ID: IKM-SRS-148

TT+ shall provide a centralised Help Centre:

For the centralized implementation (NIP scenario), all commands shall share the same centralised Help Center (no need to install a separate Help Center for every command).

For standalone implementations, the TT+ instance shall have a dedicated Help Center.

The user shall be able to access a centralised help centre site regardless of the command. The user shall be able to search common help questions, find related SOPs, find the contact numbers and email addresses for the help centre. The user should also be able to speak to a real competent person.

Verification Method: Test

Requirement ID: IKM-SRS-149

TT+ shall allow a user to send a Tasker Product to the external documents landing zone:

When the system is configured to be connected to an external documents landing zone, the user shall be able to send the final Tasker product to the configured external documents landing zone.

Verification Method: Test

Requirement ID: IKM-SRS-150

The selected task shall be highlighted on the sub tasks tree:

on the sub tasks page (within a Tasker, on the 'Tasks' tab), the selected task shall be highlighted on the tasks tree on the left hand side.

Verification Method: Test

Requirement ID: IKM-SRS-151

TT+ shall provide a configurable Business Intelligence (BI) Reporting component:

For the TT+ baseline, it shall be configured to provide the default pie chart reports that came with TTE:

Verification Method: Test

- Taskers by office (exclude archived taskers)
- Taskers by status (exclude archived taskers)

Requirement ID: IKM-SRS-152

The TT+ shall allow to print the taskers list by exporting from the tasker list, the office inbox, any view, and subtasks into an Excel or PowerPoint file for printing.

Verification Method: Test

Requirement ID: IKM-SRS-153

The TT+ shall hide or disable Site Content button from users so that only functional administrator, and site collection administrators are able to see the site contents.

Verification Method: Test

Requirement ID: IKM-SRS-154

The TT+ shall Ensure all tasker details are hidden from users who are not members of close hold taskers

Verification Method: Test

Requirement ID: IKM-SRS-155

The TT+ shall prevent the user to add dates in the past in the tasker for the following date fields: suspense date, contribution date, target completion date, coordination date, date due to HQ, validation date , COS action date, Note that dates are different depending on the site.

Verification Method: Test

Requirement ID: IKM-SRS-156

The TT+ shall allow to add field description for each metadata element in the tasker so that subsequent users receive information on what should be included in each field along with an example if necessary. (i.e. greyed out text or hint)

Verification Method: Test

Requirement ID: IKM-SRS-157

The TT+ shall pre-set the Suspense Date to "today plus 3 weeks" value in the tasker as default but user can change it afterwards.

Verification Method: Test

Requirement ID: IKM-SRS-158

The TT+ shall ensure all actions and changes to tasker to be listed in History (i.e.: change in Instructions field)

Verification Method: Test

Requirement ID: IKM-SRS-159

The TT+ shall mark archived taskers in their metadata so that they can be filtered in views.

Verification Method: Test

Requirement ID: IKM-SRS-160

The TT+ shall remove the Upload Multiple documents button if feature not supported

Verification Method: Inspection

Requirement ID: IKM-SRS-161

The TT+ shall provide an option for preventing uploading documents in regular Taskers' document libraries but allowing uploading links instead. So that when the option is enabled, the tasker prevents the user from uploading the document in the tasker. Instead the user has to upload the link. (User must previously store the document in EDMS). The upload of documents must always be possible for Close Hold taskers.

Verification Method: Test

Requirement ID: IKM-SRS-162

The TT+ shall ensure no folders are created in Links Libraries

Verification Method: Test

Requirement ID: IKM-SRS-163

The TT+ shall implement the Category metadata (Product, Point Paper...etc.) in the tasker Links

Verification Method: Test

Requirement ID: IKM-SRS-164

The TT+ shall implement a traffic light feature for subtasks as they are for tasks

Verification Method: Inspection

Requirement ID: IKM-SRS-165

The TT+ shall implement an Alert Subscription system to tell any contributor when sub task status reaches subscribed status

Verification Method: Test

Requirement ID: IKM-SRS-166

The TT+ shall prevent the creation of subtasks on closed taskers

Verification Method: Test

Requirement ID: IKM-SRS-167

The TT+ shall include additional tasker metadata in the notification email when subtask is issued. A configurable email shall include it

Verification Method: Test

Requirement ID: IKM-SRS-168

The TT+ shall provide a Mail to All members function in the Tasker

Verification Method: Test

Requirement ID: IKM-SRS-169

The TT+ shall guarantee the consistency of the Taskers dates so that Creation Dates are always earlier than Suspense and End Dates

Verification Method: Test

Requirement ID: IKM-SRS-170

The TT+ shall support up to 5000 open taskers per Command

Verification Method: Test

3.4 Workspace

Requirement ID: IKM-SRS-171

The IKM Tools shall provide the means to share an information product among other selected users for simultaneous editing as in EDMS and NIP. The user can select the permissions levels to grant to other contributors based on existing security policies and permissions leveraging the IKM Tools Framework Runtime.

Verification Method: Test

Requirement ID: IKM-SRS-172

The IKM Tools shall provide the means to uniquely identify the content leveraging the IKM Tools Framework Runtime

Verification Method: Analysis

Requirement ID: IKM-SRS-173

The IKM Tools shall support the play-back of audio, and display of video and textual information. (i.e. documents, presentations, recordings, etc.) as NIP and leveraging the IKM Tools Framework Runtime.

Verification Method: Test

Requirement ID: IKM-SRS-174

The IKM Tools shall support the use of metadata (profile) information of users, processes and services to control access and permissions to workspace information leveraging the IKM Tools Framework Runtime

Verification Method: Analysis, Inspection

Requirement ID: IKM-SRS-175

The IKM Tools shall support the integrity, completeness, security, compliance and reuse of information products by supporting their review, assessment, retention and disposition. This includes support for the management of the information product's lifecycle at the "Planning" and "Disposition" phases with policies and governance processes.

Verification Method: Analysis

3.4.1 Information Product

In general IKM Tools defines a higher abstract entity called Information Product (IP) that consists of: the content (image, document...etc.), possibly a signature and core metadata as depicted in the following figure:

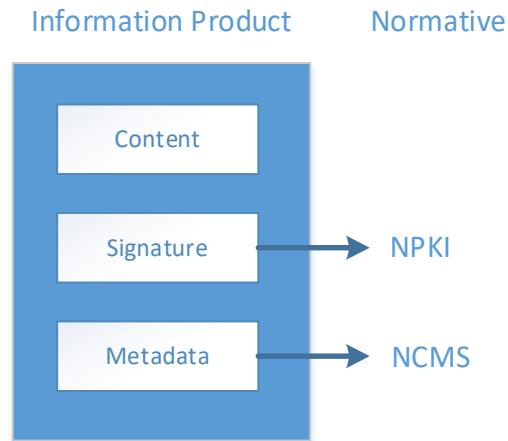


Figure 10 Information Product in IKM Tools

The information product base implementation in Share Point is the 'item' content type.

Requirement ID: IKM-SRS-176

If the Enterprise NATO Public Key Infrastructure (NPKI) is available the IKM Tools shall support the signature of the IP using the NPKI to guarantee the IP authenticity and integrity. Else using the already existing NPKI.

Verification Method: Test

Requirement ID: IKM-SRS-177

The IKM Tools shall adhere to the Confidentiality Labelling for Information Sharing [Ref. AC/322(CP/1)N(2015)0021] for IP security metadata tagging and labelling.

Verification Method: Analysis

Requirement ID: IKM-SRS-177b

The IKM Tools shall adhere to the NATO Core Metadata Specification (NCMS) [Ref. STANAG 5636] for IP metadata tagging and labelling.

Verification Method: Analysis

Requirement ID: IKM-SRS-178

The IKM Tools shall allow the user to tag the IP with metadata available in the system (Taxonomy, Managed Metadata, Keywords and Likes) and also new metadata introduced by the user.

Verification Method: Test

Requirement ID: IKM-SRS-179

The IKM Tools shall automate as much as possible the tagging of IP metadata based on the IP content. That is if the IP contains metadata fields which values are within the IP content the IKM Tools shall automatically populate them.

Verification Method: Test

Requirement ID: IKM-SRS-180

The IKM Tools shall provide a mechanism for identifying the authoritative source (i.e. author) of the IP.

Verification Method: Test

Requirement ID: IKM-SRS-181

The IKM Tools shall allow a mechanism for multiple users to be able to simultaneously update IPs so that all user's modifications are taken into account and do not interfere.

Verification Method: Test

Requirement ID: IKM-SRS-182

The IKM Tools workspace shall support the entire lifecycle of an information product: creation, capture, update, storage, transformation, distribution and disposal compatible with EDMS and NIP, and leveraging the IKM Tools Framework Runtime. Supporting the correspondent templates and metadata and applicable to, at least these information products:

Verification Method: Test

- MS Office products (documents, workbooks, presentations etc.)
- Open Standard office product
- Audio recordings
- Videos recordings
- Emails
- PDFs XML files (that may include battle-space objects and definitions)
- Instant Messages recordings.
- Tasks (activities, processes) Events
- Unformatted text (generic content types, etc.)

Requirement ID: IKM-SRS-183

The IKM Tools shall ensure a consistent metadata tagging so that the metadata within the file is the same as the metadata depicted to the user in the portal, i.e.: a file with property Classification and value NATO UNCLASSIFIED is shown in a list with the column Classification NATO UNCLASSIFIED. And this consistency is maintained throughout the entire file life-cycle (i.e.: if there is a

modification in the Share Point column list metadata, it automatically updates the correspondent metadata in the file properties, and reverse).

Verification Method: Test

Requirement ID: IKM-SRS-184

The IKM Tools workspace shall support the capture of information using information templates.

Verification Method: Analysis

Requirement ID: IKM-SRS-185

The IKM Tools workspace shall support the metadata provisioning (profiling) of workspace(s) and information.

Verification Method: Analysis, Inspection

Requirement ID: IKM-SRS-186

The IKM Tools workspace shall ensure mandatory metadata (profile) information of workspace(s) and information is provisioned and sustained throughout their respective lifecycles.

Verification Method: Analysis

Requirement ID: IKM-SRS-187

The IKM Tools workspace shall ensure mandatory metadata (profile) information of processes is provisioned and sustained throughout their respective lifecycles.

Verification Method: Analysis

Requirement ID: IKM-SRS-188

The IKM Tools workspace shall support the creation of information products. (i.e. documents, presentations, spreadsheets, other file types, etc.) through collaborative processes.

Verification Method: Test

Requirement ID: IKM-SRS-189

The IKM Tools workspace shall support processes for the capture of metadata (profile) information of workspace users, processes and information.

Verification Method: Analysis

Requirement ID: IKM-SRS-190

The IKM Tools shall support the profiling of content and consumers (users and services) using metadata and supporting taxonomies (controlled, semi-controlled and open), ontologies, data models and standard data elements. This

includes support for content versioning. This applies to the entire lifecycle for that content leveraging the IKM Tools Framework Runtime

Verification Method: Analysis

3.4.1.1 Distribution and Archiving

As the objective is that the NATO Enterprise will adhere to the “Responsibility to share” principle and as such enable IP to be easily shared among stakeholders the Distribution feature plays a fundamental role.

Requirement ID: IKM-SRS-191

The IKM Tools shall be able to share or transfer IP between different networks and domains with the same security domain (a.k.a. security classification) in a controlled manner, in line with in place security policies.

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-192

The Archiving process for long term preservation shall follow the same approach as distributing IP's regarding signature and metadata preservation

Verification Method: Analysis

Requirement ID: IKM-SRS-193

The IKM Tools shall support the export and import of information products to and from Content Management Systems (CMS) that comply with Content Management Interoperability Services (CMIS). This also includes support for metadata and other pertinent governances related to that content to those associated systems.

Verification Method: Analysis

Requirement ID: IKM-SRS-194

The IKM Tools shall be able to export and import information products that comply with the IKM Tools archiving and exporting specifications (ref INFORMATION SHARING WITHIN NATO, AC/322-N(2010)0026-REV1) without data and metadata loss, that is, preserving original information.

Verification Method: Analysis

Requirement ID: IKM-SRS-195

The IKM Tools shall export the information products following the Industry and NATO standards maintaining the information product's format whenever possible:

Verification Method: Test

- Standards: Open Packaging Convention (OPC) ECMA-376, STANAG-4774, STANAG-4778
- TN-1491 Edition 1: "Profiles for binding metadata to a data object" , using the profile that best suits the information product format

Requirement ID: IKM-SRS-196

The IKM Tools shall be able to export and archive the non- OPC compliant information products with their metadata included in their format container's properties:

Verification Method: Test

- Images: JPEG, GIF, JPG
- Audio and video: NISP Standard - MPEG-4, MPEG-2
- ASCII text-formatted data: txt
- Portable Document Format, ISO 32000-1: PDF

For an Information Product to be distributed, or send outside the IKM Tools system while preserving it's metadata a particular process must be followed. This process involves existing services with well documented guidelines.

The intent is to guarantee the IP contains the enriched information for another system to take advantage of. Conversely a reverse process is also envisaged when importing an IP with metadata from another system.

Requirement ID: IKM-SRS-197

When an IP is to be exported it shall use a Metadata Binding Service (MBS) to attach the IP metadata to the exported file (bind) (see NATO Metadata Binding Service sample). Conversely when an IKM Tools compatible IP is imported into the IKM Tools the Binding Service shall detach the IP metadata (unbind) and store it appropriately in the destination IKM Tools library. See Figure below:

Verification Method: Analysis

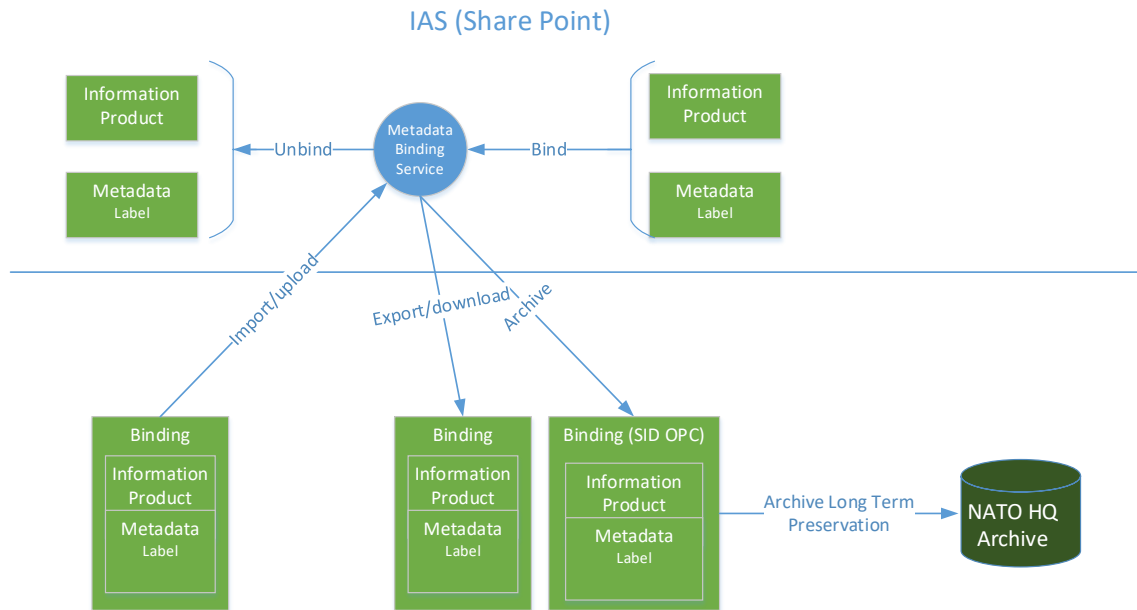


Figure 11 Distribution and Archiving

Requirement ID: IKM-SRS-198

The MBS shall follow the specification STANAG 4774 for metadata syntax, and STANAG 4778 for binding the information product metadata (stored in the file properties space or Share Point space) with its content

Verification Method: Analysis

Requirement ID: IKM-SRS-199

The IKM Tools shall extract the information product metadata and store it in the appropriate space in the IKM Tools (Share Point or other) so that the information product metadata is recognized in the IKM Tools as any other information product

Verification Method: Test

Requirement ID: IKM-SRS-200

The IKM Tools shall use a MBS to atomic sign the metadata with its related content (applicable to all IP) to guarantee the integrity of the tagged content (not to confuse with the integrity of the entire IP).

Verification Method: Test

Requirement ID: IKM-SRS-201

The IKM Tools shall use a MBS to incorporate the signature in the proper location within the IP following the specification TN-1491 Binding Profiles.

Verification Method: Analysis

Requirement ID: IKM-SRS-202

An imported IPs may be subjected to metadata change, when mapping original metadata with the available agreed metadata in the IKM Tools. Or it may change its original metadata along the IPs lifetime. In such cases the original author signature will be invalid and therefore an IKM Tools signature shall apply from then on when exporting the IP.

Verification Method: Test

Requirement ID: IKM-SRS-203

The IKM Tools shall sign the IP with a pre-defined signature established for all outgoing IPs that may supersede the original signature when the IP was imported.

Verification Method: Test

Requirement ID: IKM-SRS-204

The IKM Tools workspace shall support the publication, distribution, subscription and delivery of information.

Verification Method: Test

Requirement ID: IKM-SRS-205

The IKM Tools workspace shall support passive and active subscriptions (aka push and pull) so that users can subscribe to events in the workspace (new document added, modified, deleted) and also an Administrator can subscribe users on their behalf (i.e.: to get news notifications).

Verification Method: Test

Requirement ID: IKM-SRS-206

The IKM Tools shall provide the ability to send notifications from the Operational Network to the Protected Network, as required by business processes.

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-207

The IKM Tools shall provide support publication and distribution of information products to and from integrated and federated services. This includes support for the management of the content lifecycle at the "Retrieval, Use, Accessibility and Transmission" phase.

Verification Method: Analysis

Requirement ID: IKM-SRS-208

The IKM Tools shall support the long-term preservation and restoration of archived content within the organisation and with its parent organisation (from staff elements through to the NATO Archivist). This includes support for the

management of the content lifecycle at the "Planning", "Retrieval, Use, Accessibility and Transmission" and "Disposition" phases.

Verification Method: Analysis

Requirement ID: IKM-SRS-209

The IKM Tools shall support retention and disposition IPs policies so that an authorized user can set up retention times, metadata workflow changes in the IP, IP location changes and other related archiving mechanisms to ensure a consistent and durable IP archiving.

Verification Method: Test

Requirement ID: IKM-SRS-210

The IKM Tools shall implement an archiving mechanism following the Industry accepted standard framework Open Archival Information System. Notably implement the two packages:

Verification Method: Analysis

- Submission Information Package (SIP): for the information products sent to the archive (compatible with NATO Docs system)
- Dissemination Information Package (DIP): for the information sent to a user when requested

Requirement ID: IKM-SRS-211

The IKM Tools shall be able to automatically replicate information from one portal to another in line with predefined rules.

Verification Method: Test

Requirement ID: IKM-SRS-212

The IKM Tools shall support multiple domain publishing so that user can publish information in various domains within the same security domain and being commensurate with the user permissions.

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-213

The IKM Tools shall provide mechanism to record physical media information with metadata, including their physical location.

Verification Method: Analysis

3.4.1.2 Sharing

To empower users in the NATO Enterprise to seamlessly work together in workflows a Sharing capability is envisaged in IKM Tools. This capability enables users to set and get notifications as part of the workflows actions regardless where they sit, if in the ON or in the PBN.

As sharing also entails IP collaboration allowing multiple users to simultaneously edit a document, add comments and review modifications.

Requirement ID: IKM-SRS-214

The IKM Tools shall provide the ability to replicate selected information products from the Protected Business Network to the Operational Network using the ITM services. This information shall be made them available as required by business processes and security permissions.

Verification Method: Test
Analysis

Requirement ID: IKM-SRS-215

The IKM Tools shall mark in the information product metadata to indicate whether it has been send or replicated to another domain: from PBN to ON or other

Verification Method: Inspection

Requirement ID: IKM-SRS-216

The IKM Tools shall support the controlled access and use of content (ACL, OLP, DRM, etc.) and thereby ensure managed security, access and protection of content. This applies to the entire content lifecycle from creation through to final destruction, particularly at the "Storage and Protection" phase.

Verification Method: Analysis

Requirement ID: IKM-SRS-217

The IKM Tools shall include the addressee user(s) or user group within the information product's metadata for the destination domain to rightfully distribute it. (e.g.: "To" field)

Verification Method: Inspection

Requirement ID: IKM-SRS-218

The IKM Tools shall retrieve the transferred information product from the ITM stored location and upload it into a library in IKM Tools accessible only to the addressee(s)

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-219

The IKM Tools shall uniquely identify an information product by a "Durable Link" that is fix along the time regardless the information product's change of location or name. Specifically for TT+ or EDMS documents being moved to a record center

Verification Method: Test

Requirement ID: IKM-SRS-220

The IKM Tools shall make use of the ITM available cross domain services for transferring an information product from PBN to ON

Verification Method: Test, Analysis

Requirement ID: IKM-SRS-221

The IKM Tools shall provide a mechanism to support knowledge transfer between staff: information such as emails, documents, links and relevant data. Specially indicated for staff rotation so that the replacement staff can easily access formal staff information, preserving access control and allowing Administrators to oversee the information.

Verification Method: Analysis

3.4.2 Collaborative Workspace

The collaboration workspaces are very important for a comprehensive user experience when cooperating to achieve defined goals. The workspaces are shared areas among a set of participants with functional elements that enables work together, on line and also offline.

These areas are sites in the IKM Tools portal with defined governance, information organization, look and feel and functionalities.

As part of the IKM Tools they leverage the existing underlying services provided by ITM (for storage and information transfer) and ITM Share Point platform for the User experience (GUI and end user functionality).

The concept of workspace spans from the Share Point Out of the Box templates to the NIP templates (Collaboration Sites) and IKM Tools templates (see section 3.4.2.3 Templates).

Some of these workspaces behaviour may change according to where they are deployed. For instance a Collaboration Site will not hold the same user community and roles if it's on the ON or in the PBN facing internet where additional roles may be defined).

3.4.2.1 Collaboration

There are various types of collaboration according to these factors:

- Security: with different degrees of openness a workspace can be fully open for anyone to contribute to semi open with a restricted area for members to a closed hold for only members access and contributions
- Timeframe: whether it is intended for a short time collaboration and then disposal (e.g.: an event workspace) or for long lasting period (Col collaboration workspace).

The IKM Manager should take the appropriate actions to coordinate when site creation, during transition and operation and disposal. To maintain the quality and availability of information during the workspace lifecycle.

Also to ensure established policies of NATO Commands are enforced for the correct workspace operations.

Requirement ID: IKM-SRS-222

The IKM Tools shall support synchronous and asynchronous communication between users of the workspace.

Verification Method: Analysis

Requirement ID: IKM-SRS-223

The IKM Tools workspace shall support the search and discovery of workspace information leveraging the existing Search Services in the IKM Tools. This means the workspace information is indexed and searchable by Search Services and also available in the workspace as another Search Scope (or Search Data source).

Verification Method: Analysis

Requirement ID: IKM-SRS-224

The IKM Tools shall leverage the Microsoft OneDrive provided by ITM, a synchronized area where to sync user's local machine information. This information is therefore accessible offline and synchronized with the IKM Tools whenever the user's device becomes reachable to IKM Tools.

Verification Method: Analysis

Requirement ID: IKM-SRS-225

The IKM Tools shall provide the ability to create shared workspaces based on topics (i.e. Community Sites) for authorized users to manage, share, upload and store information related to a topic.

Verification Method: Analysis

Requirement ID: IKM-SRS-226

The IKM Tools shall allow authorized users to configure and customize the workspace for look and feel, content sharing and collaboration notifications (alerts, RSS)

Verification Method: Analysis

Requirement ID: IKM-SRS-228

The IKM Tools shall provide users with a mechanism to leave messages or comments addressed to other users in the workspace or information product. The messages shall include the actual message content plus the author and creation time and only visible to the addressee.

Verification Method: Test

Requirement ID: IKM-SRS-229

The IKM Tools shall ensure the IPs can be protected from unauthorised modification, dissemination, viewing and printing. So that an authorized user can set up Information Rights Management (IRM) restrictions to a particular IP.

Verification Method: Test

3.4.2.2 Reporting

3.4.2.3 Templates

Aside from the Share Point out of the box templates, there will be the NATO Enterprise Portal Templates which will be tailored Share Point templates for specific use cases. These templates will be already implemented by another project and the IKM Tools will integrate them by making them available in the Catalogue for its instantiation.

Requirement ID: IKM-SRS-230

The IKM Tools shall enable to instantiate the NATO Enterprise Templates from the Catalogue:

Verification Method: Test

- Document Collaboration
- Extranet/Intranet Front Page
- Exercise
- Tasking Workflow
- Project Workspace
- Event Template
- Document Publishing
- Wiki

Requirement ID: IKM-SRS-231

These templates shall be available for the IKM Managers to instantiate following the same NIP acquisition process in the NIP Catalogue when procuring services.

Verification Method: Test

The exact definition of the templates content is derived from the Bi-SC AIS users and Command user's common needs.

Once instantiated they can be modified to better fit the needed functionality by the user (e.g.: changing title label).

Requirement ID: IKM-SRS-232

The IKM Tools shall allow the creation of workspace templates from existing workspaces or as new (from no template)

Verification Method: Test

Requirement ID: IKM-SRS-233

The IKM Tools shall provide a Project Collaborative Workspace template with the following features:

Verification Method: Test

- a workspace where to share information among the project members: administrative details, milestones, deliverables, working documents, minutes and alike
- access adhered to RBAC policies set up by the Project Collaborative Workspace manager role
- connected and synchronized with Microsoft EPM if available so members can track the activities and issues with different views
- different views organizing the project information products: Miscellaneous, Start-up, Initiation, Execution, Closure, Logs, Deliverables, Project Documents, Reporting
- all project documents tagged automatically with the project code and name
- a list of all project members and their correspondent roles and contact details: email, phone and organizational element
- a list of Tasks connected to EPM (if available)
- a list of Issues
- a list of Risks
- template with a look and feel consistent with the existing IAS

Requirement ID: IKM-SRS-234

The IKM Tools shall provide an Event Collaborative Workspace template with the following features:

Verification Method: Test

- a workspace where to share information of the event and accessible to the event members
- access adhered to RBAC policies set up by the Event Collaborative Workspace Manager role
- tag the event with applicable NCMS metadata (i.e. security classification, active/in-active)
- Configurable event type categorization with at least: seminar, exercise, training, conference, visit, meeting categories
- a calendar depicting the event information
- a registration mechanism for participants to register the event with notification emails to and from the requester and the Event Collaborative Workspace Manager role
- a view where to see the participants and their registered metadata
- a mechanism to manage the participants with at least approve, reject, lock and notify operations
- template with a look and feel consistent with the existing IAS

Requirement ID: IKM-SRS-235

The IKM Tools workspace shall provide Community of Interests (Col) aligned with NIP and EDMS: following similar lifecycle process for definition, procurement, implementation and maintenance. The Col are workspaces related to a community of users and with a medium-long lasting life unlike Community Sites. The Col are focused on a capability area (JSR, C2...etc.), therefore with need of document sharing capabilities, versioning and user's cooperation via comments, notes and alike. Col's are controlled sites to the specific purpose of the community so a IKM Manager role is needed to control access and content management, and in general to set the particular policies of the Col.

Verification Method: Test

3.4.2.4 Administration

Administering the workspaces is similar to workflows as it is focused on maintaining the correct functioning of the workspace functionality and that will follow the same procedures as described in the workflow section.

Requirement ID: IKM-SRS-236

The IKM Tools workspace shall provide the usage, administration, maintenance and sustainment of web content, information products and metadata throughout their respective lifecycles as in EDMS and NIP, and leveraging the existing IKM Tools Framework Runtime

Verification Method: Test

Requirement ID: IKM-SRS-237

The IKM Tools workspace shall provide the administration, maintenance and sustainment of workspace(s) throughout their respective lifecycles, similar to EDMS and leveraging in the existing IKM Tools Framework runtime

Verification Method: Test

Requirement ID: IKM-SRS-238

The IKM Tools shall allow the creation of workspaces with different degrees of collaboration audiences: closed (for members only), semi closed (with a public area and protected area for members only) and open (for every authenticated user collaboration).

Verification Method: Test

Requirement ID: IKM-SRS-239

The IKM Tools shall allow the creation of workspaces to authorized user via a web GUI.

Verification Method: Test

Requirement ID: IKM-SRS-240

The IKM Tools shall support the management of workspace(s) throughout their respective lifecycles.

Verification Method: Test

Requirement ID: IKM-SRS-241

The IKM Tools workspace shall support Information Management Policies in accordance to The primary directive on Information Management (C-M(2008)0113 (INV)) and the ones defined in the existing IKM Tools Framework runtime. So that policies can be applied to workspaces, its content and imported and exported.

Verification Method: Test

Requirement ID: IKM-SRS-242

The IKM Tools shall grant the user interactions with the workspace in accordance to the user's role (RBAC)

Verification Method: Test

Requirement ID: IKM-SRS-243

The IKM Tools workspace shall support processes for the review and qualification of workspace information for retention, disposition, declassification and destruction.

Verification Method: Test

Requirement ID: IKM-SRS-244

The IKM Tools workspace shall support processes for the backup, archiving and restoration of workspace information.

Verification Method: Test

Requirement ID: IKM-SRS-245

The IKM Tools shall provide a Catalogue of services in the GUI for authorized users to procure services and templates (i.e.: Collaboration Workspace).

Verification Method: Test

Requirement ID: IKM-SRS-246

The IKM Tools Catalogue shall follow a process by which a user can request a new service, a new feature or a Change Request and adheres to the IKM Governance Body process (ref: BICMB)

Verification Method: Test

Requirement ID: IKM-SRS-247

Services in the Catalogue shall include at least the IKM Tools (NIP, EDMS, TT+) and templates defined in section 3.4.2.3 Templates.

Verification Method: Test

3.4.3 Services

The Workspace Application needs to be available for external systems and FASs to provide collaboration spaces integrated with their systems. For that the IKM Tools must offer interfaces that are well known and adhered to recognized standards to facilitate the implementation.

Requirement ID: IKM-SRS-248

The IKM Tools workspace shall comply with the Content Management Interoperability Services v.1.0 (CMIS) standard when exposing its functionality as web services

Verification Method: Analysis

3.4.3.1 Web Services

3.4.3.2 Collaboration Services

Requirement ID: IKM-SRS-249

The IKM Tools shall integrate with the SOA and IdM Information Discovery Services to retrieve information products as a federated search

Verification Method: Test, Analysis

3.4.3.3 Presentation Services

Requirement ID: IKM-SRS-250

The IKM Tools shall support the navigation and browsing of the workspace and workspace information as in EDMS and NIP, and leveraging the IKM Tools Framework Runtime

Verification Method: Inspection

Requirement ID: IKM-SRS-251

The IKM Tools shall support the physical reproduction of still imagery and textual information as in EDMS and NIP

Verification Method: Inspection

Requirement ID: IKM-SRS-252

The IKM Tools shall allow a configurable presentation of information products, lists and mash-ups according to a selected criteria as in EDMS and NIP and leveraging the IKM Tools Framework Runtime.

Verification Method: Inspection

Requirement ID: IKM-SRS-253

The IKM Tools shall support configurable views and representations of information products and workspace(s).

Verification Method: Inspection

Requirement ID: IKM-SRS-254

The IKM Tools shall allow views and pre-views of information products within the web GUI.

Verification Method: Test

3.4.4 EDMS extension

Similarly to the TT+ extension the EDMS extension is to deliver identified capabilities not implemented in the first IAS Step 1.

Requirement ID: IKM-SRS-255

The IKM Tools Workspace shall be available on the Operation Network (ON) and on the Protected Business Network (PBN)

Verification Method: Test

Requirement ID: IKM-SRS-256

The IKM Tools shall support the management, administration, maintenance and sustainment of content and of their supporting systems (in conjunction with SMC, IA and other services) throughout the content lifecycle. This includes content modelling and mapping, supportive workflows, content de-duplication,

correction and enrichment, master data, monitoring, analytics, reporting and logging. This includes support for the management of the entire content lifecycle.

Verification Method: Analysis

Requirement ID: IKM-SRS-257

The EDMS navigation shall be as the NIP navigation, e.g.: Use the backward and forward navigation functionality like in the NIP "breadcrumb trail".

Verification Method: Test

Requirement ID: IKM-SRS-258

The EDMS navigation shall allow the user to navigate forward and backwards, similar to the NIP navigation. i.e.: Go to the Record Center and return back to the initial page.

Verification Method: Test

Requirement ID: IKM-SRS-259

The EDMS shall depict the name Records Centre when referring to Record Centre in all pages

Verification Method: Inspection

Requirement ID: IKM-SRS-260

The EDMS shall be able to move and copy minor and major versions documents by keeping the versioning and permissions.

Verification Method: Test

Requirement ID: IKM-SRS-261

The EDMS shall mark the documents that have been send to the Records Centre in its metadata field 'Send to' with value 'Record Centre'

Verification Method: Test

Requirement ID: IKM-SRS-262

The EDMS shall change title Related tasker(s) to Related Tasker

Verification Method: Inspection

Requirement ID: IKM-SRS-263

The EDMS shall remove 'Follow' button from the Office inbox page

Verification Method: Inspection

Requirement ID: IKM-SRS-264

The EDMS shall allow the user to upload multiple files

Verification Method: Test

Requirement ID: IKM-SRS-265

The EDMS shall allow approval and validation process in each step of the workflow: publishing, recording (convert to PDF) and archiving (store in Record Centre), so that an authoritative user can approve/validate the document in each of these steps.

Verification Method: Test

3.5 Current IKM Tools (NIP, EDMS and TT+) functionality

The current IKM Tools delivered functionality is specified here to clarify and further extend the code the Purchaser handed out to the Contractor.

If any function is unclear or not well defined the provided IKM Tools functionality shall prevail, i.e.: by executing Create new Tasker in TT+ function will expose what's required by the Contractor, the implementation specifics can vary but the outcome and functionality flow shall be the same.

Requirement ID: IKM-SRS-266

The Contractor shall deliver, at least, the same functionality as the current IKM Tools.

Verification Method: Test

3.5.1 NATO Information Portal (NIP)

3.5.1.1 General

3.5.1.1.1 Introduction

The NATO Information Portal (NIP) is the Web Hosting service on the Bi-SC AIS high side network (Operational Network, ON). Its technology is based on MS SharePoint 2013 delivered from Bi-SC AIS secure centralised Data Centres geo-redundant (Mons and Naples).

The NIP business model is “cloud-oriented” with the purpose of being the single point of access (SPOE) on NS Network.

The NIP aim is to decommission NATO Web Information Services Environment (WISE) portal capabilities scattered around the Bi-SC AIS

The NIP service is providing interface to:

- Formal Workspaces and Records: EDMS
- Formal Taskers: TT+

It is developed as a web portal to fulfil the following functions:

- Web Content Management
- Search

- Social Computing and Networking
- Information and Knowledge Publishing
- Metadata Management

3.5.1.1.2 Integration

3.5.1.1.2.1 Search

Requirement ID: NIP-1

Contractor shall deliver an External Search Service independent from the NIP/EDMS/TT+ environment.

Verification Method: Test

Requirement ID: NIP-2

Consume External Search Service. NIP/EDMS/TT+ shall be able to be indexed by an external SharePoint based search service. While preserving the NIP access content permissions, so only users allowed to access NIP content can search it (not applicable to metadata).

Verification Method: Test

Requirement ID: NIP-3

The External Search Service shall use only the SharePoint permission trimming feature.

Verification Method: Test

Requirement ID: NIP-4

The Search service shall provide the following filters: Originating Office, Type of the item (list item, pdf, xls), Originating Command, Author, etc.

Verification Method: Test

Requirement ID: NIP-5

The Search Service shall provide a faceted search by Search Tabs: Search Tabs are search properties based on the content types. Example: a user will like to find all articles which are related to SHAPE IKM, the user will use the Articles tab and enter "SHAPE" in the search box.

Verification Method: Test

Requirement ID: NIP-6

The Search Service shall implement the following Tabs: Articles, Events, Individuals, Exercises, Countries, Visits, Operations and Everything.

Verification Method: Test

3.5.1.1.2.2 Content Types

Requirement ID: NIP-7

The NIP shall be able to reuse content types that are being provided through a SharePoint based content type hub.

Verification Method: Test

3.5.1.1.2.3 MS Office

Requirement ID: NIP-8

The NIP shall be fully compatible with Microsoft Office 2010 and 2013 .

Verification Method: Test

3.5.1.1.2.4 Compatibility

Requirement ID: NIP-9

The NIP shall be fully compatible with ITM provided SharePoint on premises.

Verification Method: Test

3.5.1.1.2.5 Time zone

Requirement ID: NIP-10

The NIP shall be able to reuse a configurable date and time format on Site Collection level to set/reset the date/time of the whole NIP instance.

Verification Method: Test

3.5.1.1.2.6 Infrastructure

Requirement ID: NIP-11

The NIP shall be able to be installed as a stand-alone application within a standard SharePoint (ITM SharePoint version) farm.

Verification Method: Test

Requirement ID: NIP-12

The NIP shall be compatible with being installed into an existing SharePoint environment as a dedicated Web Application.

Verification Method: Test

Requirement ID: NIP-13

The NIP shall be compatible with being installed into an existing SharePoint environment and shall be able to consume global metadata from an existing term store.

Verification Method: Test

3.5.1.1.3 High level design

Requirement ID: NIP-14

The NIP shall be designed in layers so that it is highly scalable horizontally and vertically in the different functions: web front end, dedicated services like Workflow and Search) and application and database layers, see current architecture as a sample in the following figure:

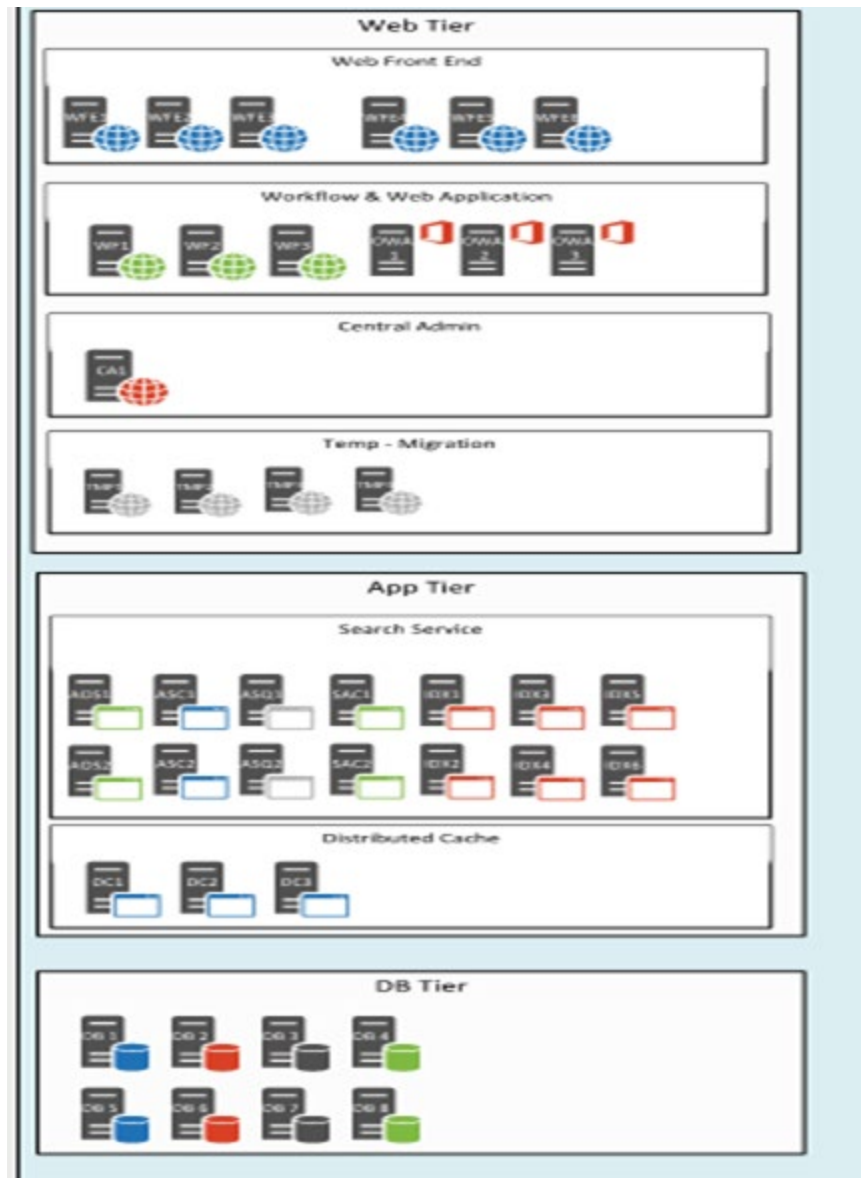
Verification Method: Test

Figure 12 Farm Topology

Requirement ID: NIP-15

The NIP shall follow the accepted Industry standards when designing the system, specifically the Microsoft best practices.

Verification Method: Test

3.5.1.1.3.1 High Level Design

Requirement ID: NIP-16

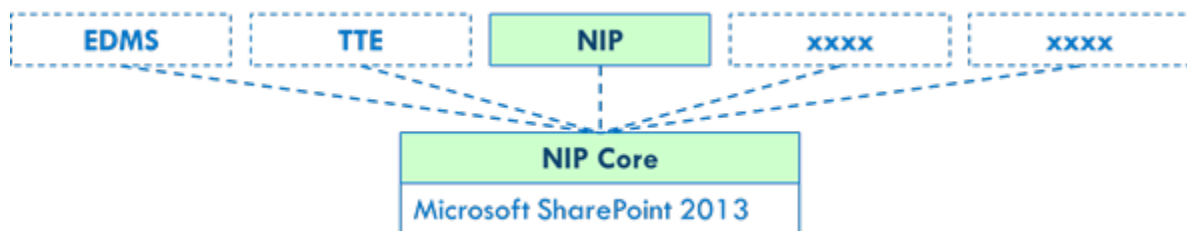
The NIP portal shall be modular to re-use existing services in the platform

Verification Method: Test

Requirement ID: NIP-17

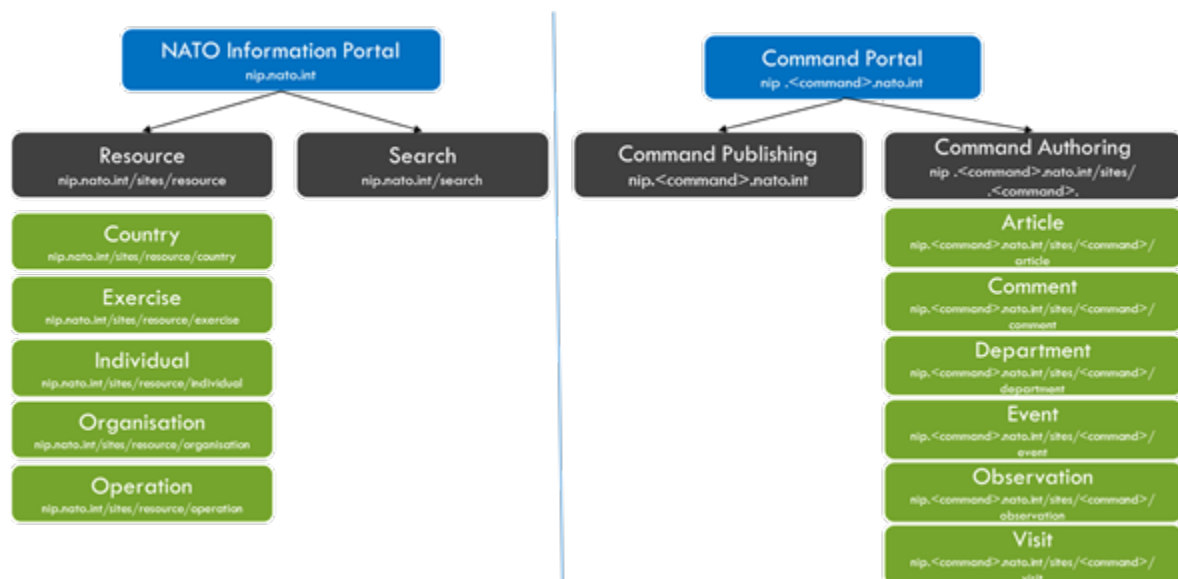
The NIP portal shall re-use the IKM Tools Framework (aka NIP Core) services for underlying dependant services like: metadata, content types, sync services and alike, see the following diagram:

Verification Method: Test



3.5.1.1.3.2 Architecture

NIP has two main areas: The resources subsite and the search subsite, see the following diagram:



Requirement ID: NIP-18

Under resources, administrators shall be able to manage Countries, Individuals, Exercises, Operations, and Organisations. Once created, these items are visible and can be used by anyone in the system.

Verification Method: Test

The Search subsite provides enterprise search functionality which allows users to find NIP content, as well as TT+ and EDMS data.

Requirement ID: NIP-19

Each Command portal shall consists of an authoring site and a publishing site.

Verification Method: Test

Users can create and edit content through the authoring site. Once the user saves the content, it is pushed over to the publishing site so that it can be visible to other users throughout the system

3.5.1.1.3.3Top Level Sites

Requirement ID: NIP-20

The NATO Information Portal (NIP) shall host top level sites each requiring a DNS entry and a SSL certificate (or a wildcard certificate for the entire portal).

Verification Method: Test

Requirement ID: NIP-21

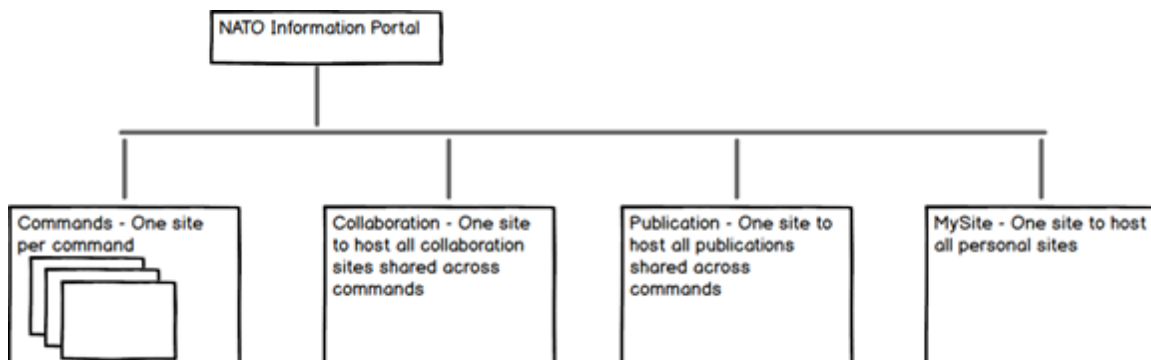
Top level sites shall be deployed as part of the portal implementation and cannot be deployed via the catalogue; additionally, all top level sites are prescriptive and under the technical administration of the NIP technical support team.

Verification Method: Test

Requirement ID: NIP-22

Each command shall have a top level site. Two additional top level sites are created to host publication and collaboration sites, deployed via the catalogue, and shared across the NATO organization. One final top level site will be used as the entry point for the users' personal sites. See the following diagram:

Verification Method: Test



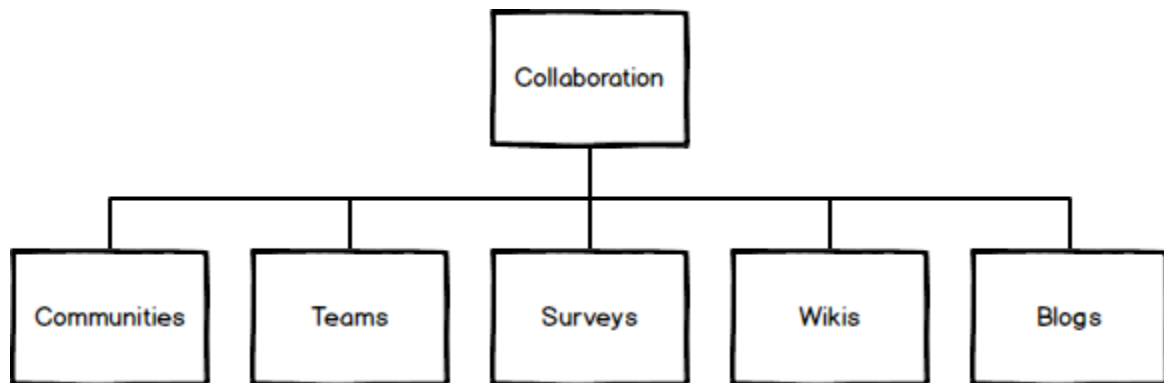
3.5.1.1.3.4Prescriptive and Free-Form Sites

Requirement ID: NIP-23

Authorized users shall be able to automatically deploy, via the catalogue, additional enterprise level sites, both prescriptive and free form under the

corresponding top level portal site. Free-form collaboration sites are provisioned in a predefined location (path) depending on their type.

Verification Method: Test

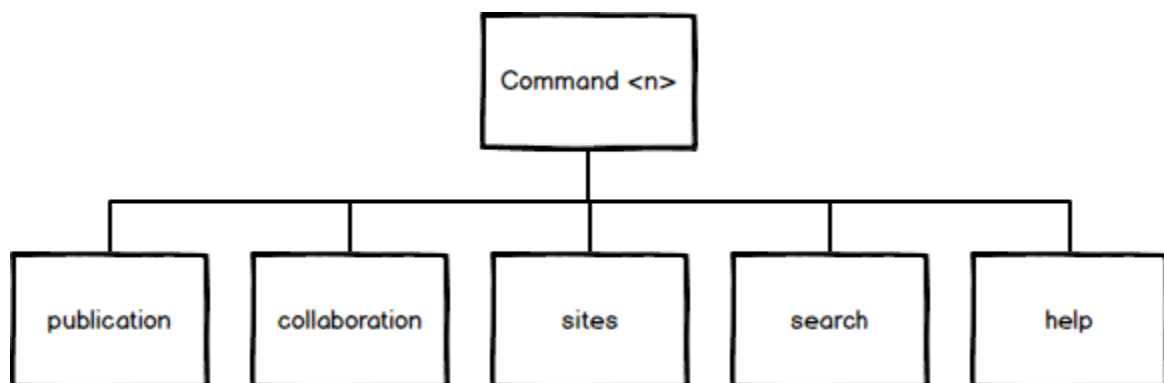


3.5.1.1.3.5 Command Sites

Requirement ID: NIP-25

Authorized users shall also request sites (prescriptive or free-form) from the catalogue to be linked to their specific command. Those sites are provisioned in predefined paths (depending on their type) belonging to the specific command.

Verification Method: Test



3.5.1.2 Functionality

3.5.1.2.1 NIP Articles

NIP users can use this feature in order to inform other users about changes, new regulations, events or any kind of news which can be related to work. Inside of an article the author can add images, tables or text. The articles can be shared with other departments, displayed on the command page or to departments from other Commands.

Requirement ID: NIP-26

NIP shall be able to provide the option to create articles

Verification Method: Test

Requirement ID: NIP-27

NIP shall provide an Article WebPart which will display the latest 3 articles created for the selected Command/Department/Community/Nation page.

Verification Method: Test

Requirement ID: NIP-28

NIP shall provide a Shared Articles WebPart in which the users can view the latest 3 articles which are shared with the accessed location.

Verification Method: Test

3.5.1.2.2 Event Management

NIP Events offer the option for the user to promote an event of different categories across the Command or to departments of other Commands. The user has the option to book a conference room for the event, can invite other users to an event (they will receive invitations on their outlook accounts) or request details from the attendees by creating a registration list inside of the event.

Events in NIP are NATO Events, Daily duties which are completed by NATO employees. For example: official visits, Training, Briefings, Meetings, book a conference room for a specific event, invite users to an event.

Requirement ID: NIP-29

NIP users shall be able to create Events of different types, Booking System and Invite users to Events.

Verification Method: Test

Requirement ID: NIP-30

The Functional Admin shall be able to create and maintain Conference Rooms.

Verification Method: Test

Requirement ID: NIP-31

NIP Users shall be able to Book a conference room inside of an Event.

Verification Method: Test

Requirement ID: NIP-32

The Functional Administrators of the NIP Event Management feature shall be able to Approve/Reject/Edit a Booking Request.

Verification Method: Test

Requirement ID: NIP-33

NIP Users shall be able to Register/Invite other NIP users to a NIP Event

Verification Method: Test

Requirement ID: NIP-34

NIP Users shall be able to Register/Invite other NIP users to a conference room booking (inside of an event).

Verification Method: Test

Requirement ID: NIP-35

NIP users shall be able to create a Registration List inside of a NIP Event.

Verification Method: Test

Requirement ID: NIP-80

The NIP User shall have the option to choose from a default list of columns for the Registration List so that:

- The AO can export a registration template and import it in another event
- An AO is only able to select from a default list
- The default list should contain the following <predefined list> and new columns visible to add to the registration
- Users will not be able to see the full list of attendees, but only their own entries

Verification Method: Test

Requirement ID: NIP-36

The NIP User shall receive notifications regarding the status of the requested bookings (Approve/Rejected/Modified)

Verification Method: Test

Requirement ID: NIP-37

The Conference Room Functional Administrator shall receive notifications if two or more bookings requests will overlap.

Verification Method: Test

Requirement ID: NIP-38

The Functional Administrator of a conference room shall receive notifications when a booking request has been created, modified or cancelled.

Verification Method: Test

Requirement ID: NIP-39

NIP shall provide a Calendar in which all the booking request of a command will be displayed.

Verification Method: Test

Requirement ID: NIP-40

NIP shall display an Event Calendar on each Command/Department/Community/Nation page which will display the total of event for the current location

Verification Method: Test

Requirement ID: NIP-41

NIP shall have a Command Calendar in which the users can view all the events from the accessed Command.

Verification Method: Test

Requirement ID: NIP-42

NIP shall have Events WebPart in which NIP users can view the latest 3 events which are posted on the accessed location.

Verification Method: Test

Requirement ID: NIP-81

NIP shall be able to identify a Strategic Level Event from a user NIP department that includes the following metadata elements so that it can be associated with Countries, Individuals and Organizations:

- Related Place
- Related Individual
- Related Organization

This event can then be published and displayed on the NIP Bi-SC calendar as follows:

- The event created in NIP department can be promoted to become a Strategic Level Event
- When selected as a Strategic Level Event, the Display on Command Page (by default) is also selected
- The Event will appear in both the Command and the Bi-SC level calendars
- Related Place, Related Individual and Related Organization metadata elements can be associated to the event.

Verification Method: Test

Requirement ID: NIP-82

NIP shall be able to register a user attendance for an event in NIP. The user is able to choose the necessary fields for the registration from the list. Event Action Officers (AO) can create a Registration Form for an event. The same AO can create views from the list.

Verification Method: Test

Requirement ID: NIP-83

The user shall have the ability to attach a file (if necessary) to the registration. An example of this could be Security Clearance or Passport details.

Verification Method: Test

3.5.1.2.3 Approval Workflow

Requirement ID: NIP-43

NIP shall provide the option for the Content Functional Administrators to approve Events and Article on the Command page.

Verification Method: Test

Requirement ID: NIP-44

Email notifications shall be sent to the Content FA for any event or articles which is requested to be published on the Command Page.

Verification Method: Test

Requirement ID: NIP-45

The NIP approval notification shall contain a link which will redirect the Content FA to the Approval page.

Verification Method: Test

3.5.1.2.4 Alert State

Requirement ID: NIP-46

NIP shall provide the option to display the Alert State of the visited Command.

Verification Method: Test

Requirement ID: NIP-47

NIP shall provide a custom list on the Publishing site which will allow the Functional Administrator to set up the Alert State for the Command.

Verification Method: Test

3.5.1.2.5 Page Classification

Requirement ID: NIP-48

NIP shall display the classification of the visited page based on the keywords in the displayed content (NIP Security Classification metadata).

Verification Method: Test

3.5.1.2.6 Footer

Requirement ID: NIP-49

NIP shall provide the ability for the user to create Footer Links

Verification Method: Test

Requirement ID: NIP-50

NIP shall provide a custom list on the publishing site of each command which will allow the Functional Administrators to create Footer Links

Verification Method: Test

Requirement ID: NIP-51

NIP shall provide the ability for the user to create Footer Categories

Verification Method: Test

Requirement ID: NIP-52

NIP shall provide a custom list on the publishing site of each command which will allow the Functional Administrators to create Footer Categories

Verification Method: Test

3.5.1.2.7 Top Level Navigation

Requirement ID: NIP-53

NIP shall provide a Top-Level Navigation which will be available for NIP users in all pages (NIP Navigation shall follow the NIP Template which is approved by the NIP Governance Board).

Verification Method: Test

Requirement ID: NIP-54

The Top Level Navigation shall contain the following links:

Verification Method: Test

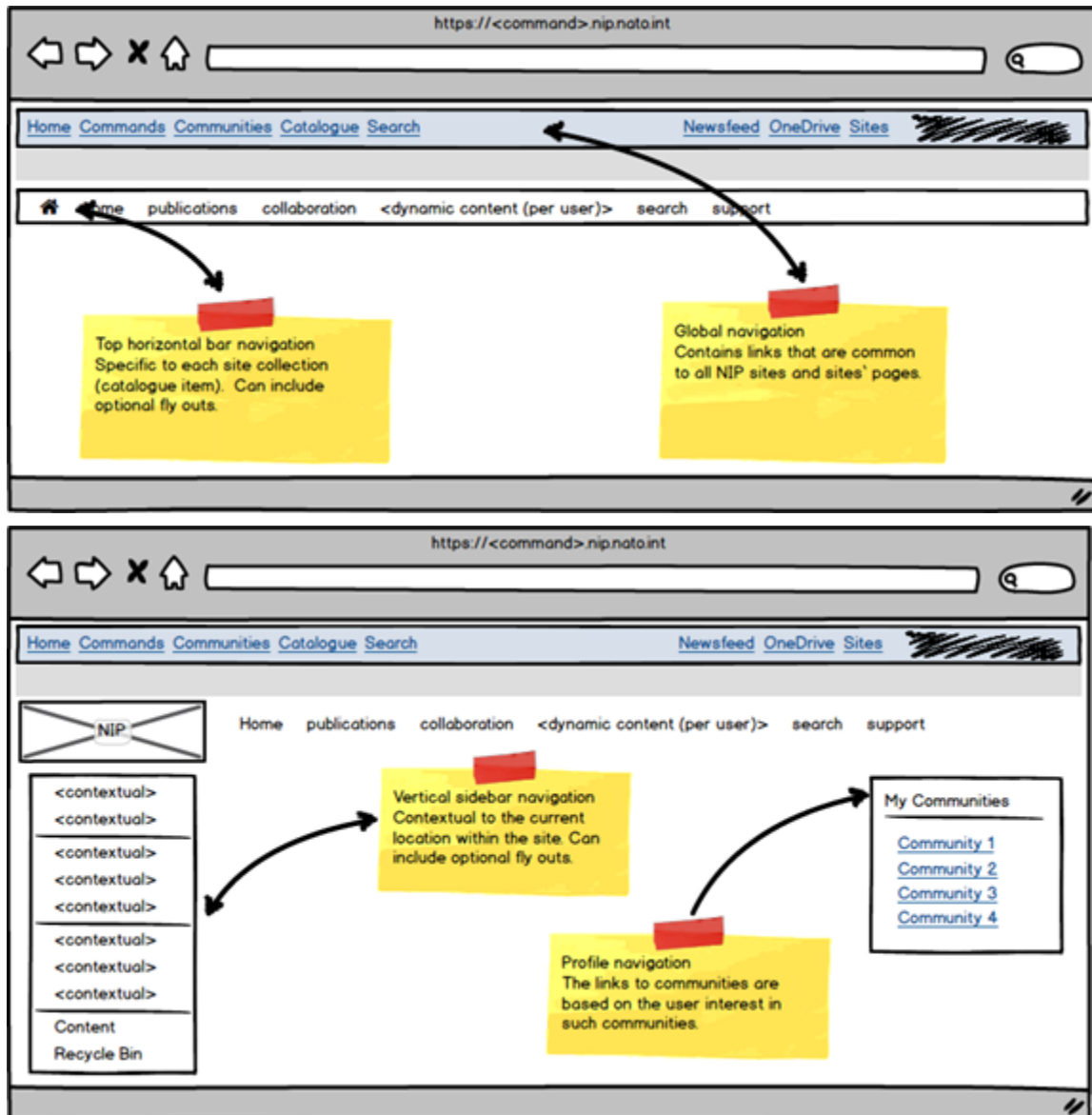
- NIP Commands
- Command Departments
- Command Communities
- Command Nations
- Booking Calendar

Requirement ID: NIP-55

NIP shall implement five types/levels of site/content navigation:

Verification Method: Test

- Global navigation: Located at the very top of the page for links that are common to all NIP sites and sites' pages.
- Top horizontal bar navigation: specific to each site collection (catalogue item). Can include optional fly outs.
- Vertical sidebar navigation: Available only in free-form sites it is contextual to the specific function performed or location within the site. Can include optional fly outs.
- Search navigation: Used to access content without knowing the exact location. Augmented with facets navigation based on metadata.
- Profile navigation: User is presented with navigation options based on his/her profile and/or browsing history.



3.5.1.2.7.1 Department Users

Requirement ID: NIP-56

NIP Users shall be able to create Departments users

Verification Method: Test

Requirement ID: NIP-57

NIP shall provide a WebPart which will display the department POC's

Verification Method: Test

Requirement ID: NIP-58

The POC WebPart shall have: Display Priority, Option "See more" in order to display more than 5 POC's

Verification Method: Test

3.5.1.2.7.2 Exercises

Requirement ID: NIP-59

NIP Users shall be able to create/edit Exercises.

Verification Method: Test

3.5.1.2.7.3 EDMS WebPart

Requirement ID: NIP-60

The NIP user shall view the latest 10 incoming documents from EDMS Command/Department/Community.

Verification Method: Test

Requirement ID: NIP-61

The WebPart Title shall be linkable and redirect users to the EDMS Workspace

Verification Method: Test

3.5.1.2.7.4 TT+ WebPart

Requirement ID: NIP-62

The NIP User shall view the latest 5 incoming taskers from TT+ Command/Department/Community.

Verification Method: Test

Requirement ID: NIP-63

The WebPart shall be linkable and redirect users to the TT+ page.

Verification Method: Test

3.5.1.2.8 Content Types

Requirement ID: NIP-64

NIP shall use content types whenever possible to ease data modularity and reuse

Verification Method: Test

3.5.1.2.8.1 Department Links

Requirement ID: NIP-65

NIP users shall have the option to create Department Links.

Verification Method: Test

Requirement ID: NIP-66

NIP shall provide a WebPart which will display the Departments Links.

Verification Method: Test

3.5.1.2.8.2 Observations

NIP Observation is the ability for NATO users to make observations related to daily activities and NIP functionalities.

Requirement ID: NIP-67

The user shall be able to add the following category of information: Remedial Notes, Observation Date, Observation details, Activity, Reference to NATO staff functions, Analysis Phase Notes, Function, Discussion, Recommendations and Conclusions.

Verification Method: Test

Requirement ID: NIP-68

NIP Users shall have the option to create Observations.

Verification Method: Test

3.5.1.2.8.3 Countries

Requirement ID: NIP-69

Specific NIP Users shall be able to create Countries and maintain the details (NMR's, NLR's and FA users).

Verification Method: Test

Requirement ID: NIP-70

NIP Country page shall have a WebPart for related individuals

Verification Method: Test

Requirement ID: NIP-71

NIP Country page shall have a Webpart which will display related events.

Verification Method: Test

3.5.1.2.8.4 Individuals

Requirement ID: NIP-72

Specific NIP Users shall be able to create Individuals (NMR's, NLR's and FA users).

Verification Method: Test

Requirement ID: NIP-73

NIP individual page shall have the following WebParts: Active Role, Former Role, Individual Details.

Verification Method: Test

3.5.1.2.9 Metadata

Requirement ID: NIP-74

NIP shall be able to use a combination of NCMS and NIP based metadata and extended NIP required metadata. Metadata fields shall be based on SharePoint columns.

Verification Method: Test

Requirement ID: NIP-75

NIP Metadata shall have at least metadata defined for (see the NIP Hub Metadata Extract for the full metadata taxonomy, content types and field types):

Verification Method: Test

- Documents
- Articles
- Links
- Events
- Countries
- Individuals
- Observations

Requirement ID: NIP-76

NIP shall allow extensions coherent with the NCMS guideline.

Verification Method: Test

Requirement ID: NIP-77

NIP shall allow users to make changes to NON-SYSTEM FILLED field to defaulted values.

Verification Method: Test

Requirement ID: NIP-78

NIP shall allow a user to assign a security classification to an activity.

Verification Method: Test

3.5.1.2.9.1 NIP Page Templates

Requirement ID: NIP-79

NIP shall provide a set of page templates with common base layout and with dedicated permissions per user groups:

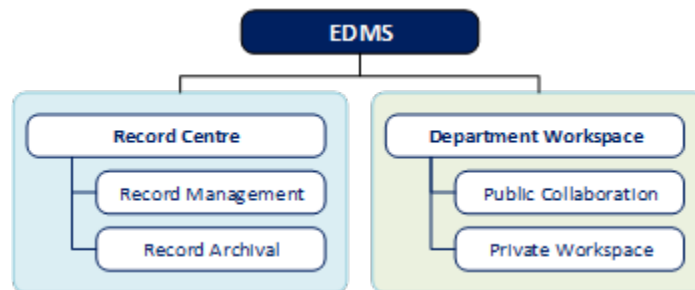
Verification Method: Test

- Command Template
- Department Template
- Community Template
- Nation Template
- Country Template

3.5.2 Enterprise Document Management System (EDMS)

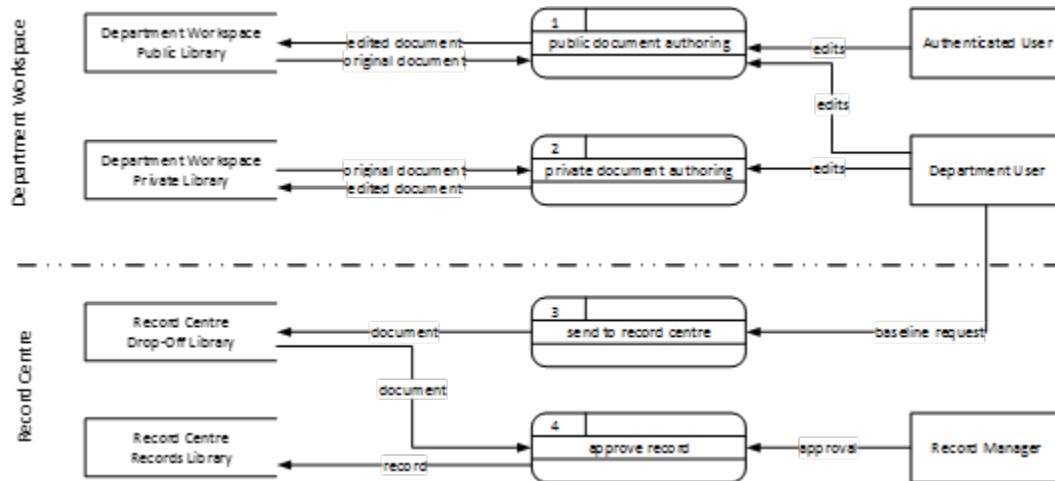
3.5.2.1 General

The EDMS application is comprised of two types of components (or services) – a Record Centre component and a Department Workspace component, see the following figure:



The Record Centre implements records management and archival capabilities, while the Department Workspace allows for document publication and collaboration, as well as private document storage and management.

During the initial rollout of EDMS, each Command will receive a single Record Centre component and multiple Department Workspace components. Department Workspace components will be implemented down to the level of “branch”. The relationship between Department Workspaces and the Record Centre is shown graphically in the Figure 3.



3.5.2.1.1 Introduction

The scope of the EDMS (Enterprise Document Management System) is the implementation of a collaborative workspace and a Document Management System (DMS) to serve as a common repository for Information Products.

The collaborative workspaces and content management repositories developed within the scope of this work package represent the implementation of the NATO Enterprise Document Management System (referred to as EDMS) leveraging Out of The Box (OOTB) technology provided by the NATO Information Portal (NIP) platform based on SharePoint 2013.

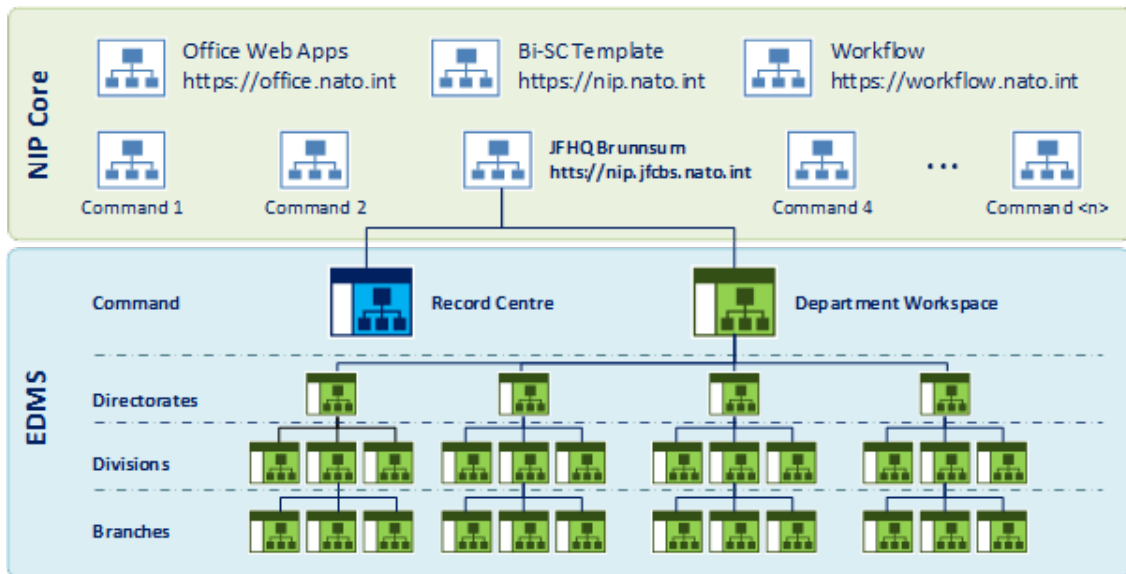
3.5.2.1.2 Integration

Requirement ID: EDMS-1

EDMS shall integrate with NIP Core

Verification Method: Test

EDMS is provisioned as a logical hierarchical structure that mimics that of the NATO Peacetime Establishment (PE) and aligns with the Organisational Units metadata element included in NIP Core. The elements of such structure from top to bottom are Command, Directorates, Divisions, and Branches; and they are collectively referred to as "departments." See the following figure:



EDMS is currently implemented in the same web application as the NIP Portal but using different URLs and different site collections.

EDMS is deployed on a “per Command” basis. When deployed, the Command receives one Record Centre and one Department Workspace while each Directorate, Division, and Branch within the Command receives one Department Workspace each. Each Department Workspace within the Command is uniquely linked to the Record Centre for that Command (see Figure 3).

Requirement ID: EDMS-2

EDMS shall be instantiated per Command so that each Command can manage his own EDMS workspace.

Verification Method: Test

Record Centres and Department Workspaces are implemented as SharePoint 2013 host named site collections, in alignment with Microsoft best practices for SharePoint 2013 and SharePoint 2016, under the “edms” managed path, while leveraging the URL structure and root Command Template implemented in NIP Core.

3.5.2.1.3 High level design

Requirement ID: EDMS-3

EDMS shall be another component or application of the IKM Tools and it runs along the other tools leveraging their services. See figure below:

Verification Method: Test

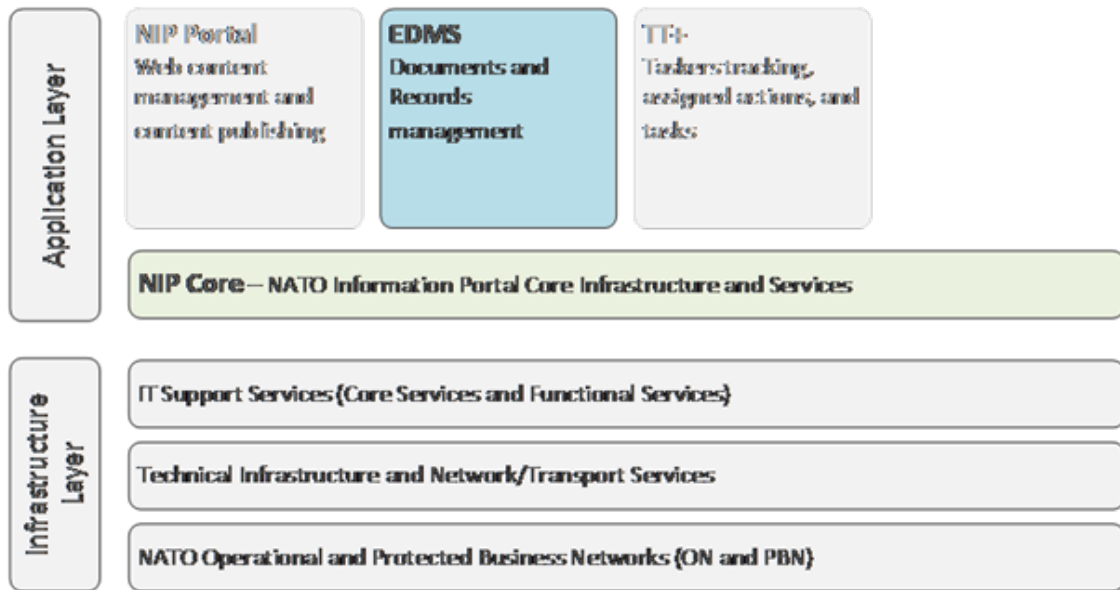


Figure 13 High Level Design

3.5.2.2 Search

Requirement ID: EDMS-4

EDMS shall leverage the Enterprise Search capabilities implemented in Run-Time NIP.

Verification Method: Test

Requirement ID: EDMS-5

EDMS shall allow the user to get search results categorized by at least these domains: Enterprise Domain Command Domain Office Document Type and TT+ domain (i.e.: via filters refiners or scope searches)

Verification Method: Test

Requirement ID: EDMS-6

EDMS shall extend the Search scope to the TT+ information source

Verification Method: Test

3.5.2.3 Functionality

3.5.2.3.1 Look & Feel

Requirement ID: EDMS-7

EDMS interface shall be similar to the current EDMS in operation look and feel.

Verification Method: Test

Requirement ID: EDMS-8

EDMS interface shall provide users with:

Verification Method: Test

Requirement ID: EDMS-9

EDMS shall have a navigation toolbar in the top area of the web pages

Verification Method: Test

Requirement ID: EDMS-60

EDMS shall allow the user to navigate to his departments NIP page from his EDMS workspace or library

Verification Method: Test

Requirement ID: EDMS-10

EDMS shall implement a search bar in the top area of the web pages

Verification Method: Test

Requirement ID: EDMS-11

EDMS shall have the contextual navigation showing site hierarchy and a site browser on the left side of the web pages

Verification Method: Test

Requirement ID: EDMS-12

EDMS shall present contextual content in the centre of the web page.

Verification Method: Test

Requirement ID: EDMS-13

The user shall be able to use the delivered EDMS GUI to browse Office/Branch files commensurate with the user's token (permissions):

Verification Method: Test

- Anonymous Users
- Authenticated Users
- Command Users
- Office/Branch/Department Users

Requirement ID: EDMS-14

EDMS site views shall be pre-defined and appropriate to each site configured using templates equivalent to those on the SHAPE EDMS, including but not limited to:

Verification Method: Test

Requirement ID: EDMS-15

EDMS shall include a Command Site template

Verification Method: Test

Requirement ID: EDMS-16

EDMS shall include a Branch/Office/Department Site Template

Verification Method: Test

Requirement ID: EDMS-17

EDMS shall include a Record Center site template

Verification Method: Test

Requirement ID: EDMS-18

EDMS Portal shall reside in the same Web Application as Run-time NIP.

Verification Method: Test

Requirement ID: EDMS-19

It shall have Site Collections underneath one per Command/Organizational Element.

Verification Method: Test

Requirement ID: EDMS-20

EDMS shall display the aggregated views for Command View

Verification Method: Test

Requirement ID: EDMS-21

EDMS shall display the aggregated views for Bi-SC View

Verification Method: Test

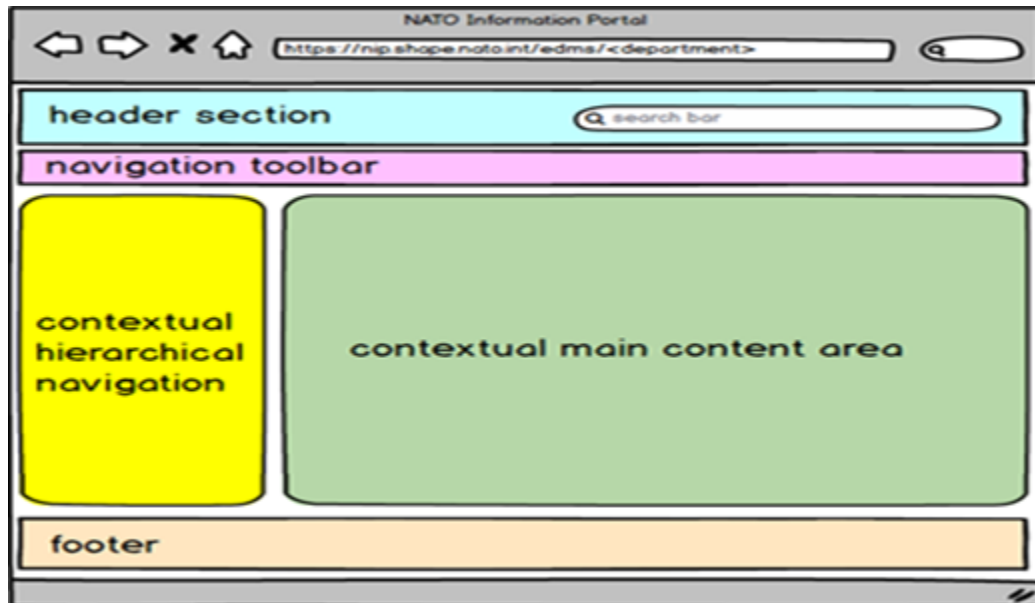


Figure 14 EDMS Page Layout

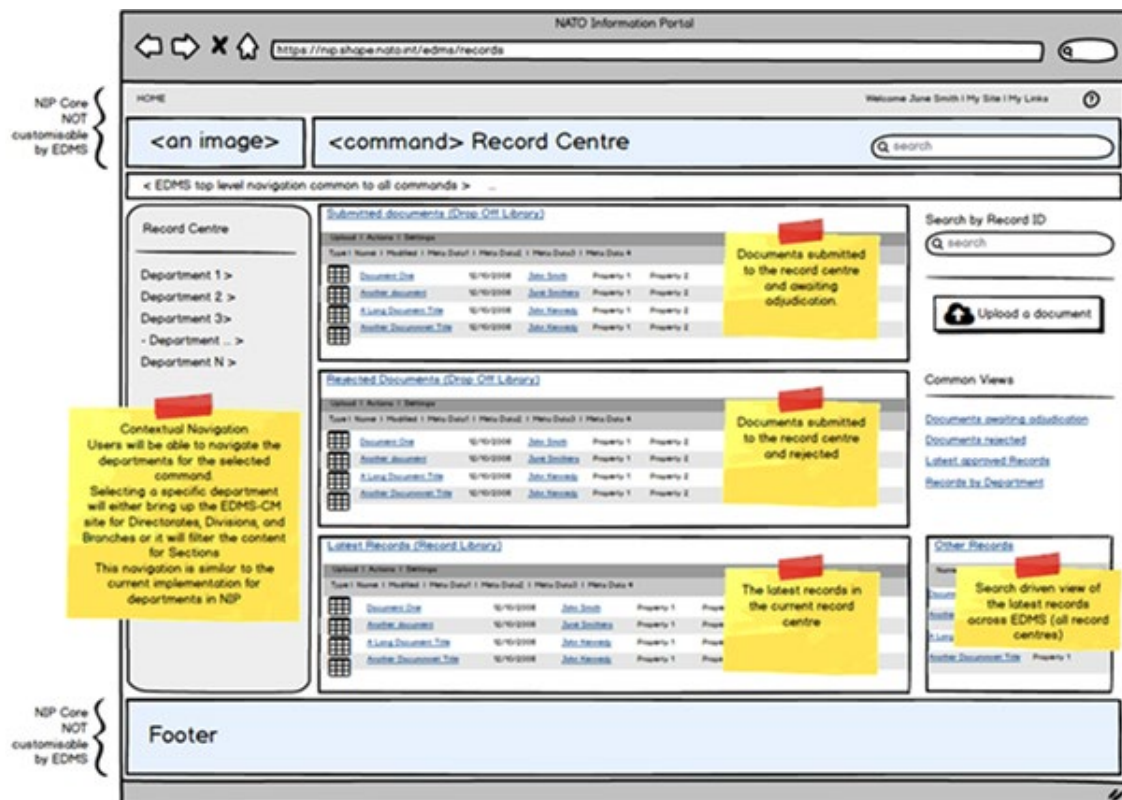


Figure 15 EDMS Landing Page

3.5.2.3.2 Presentation area elements

Requirement ID: EDMS-22

The home page of each branch/office shall display the content of the Record Centre

Verification Method: Test

Requirement ID: EDMS-23

The home page of each branch/office shall display the documents related to the branch/office

Verification Method: Test

Requirement ID: EDMS-24

Record Centre Documents

Verification Method: Test

Requirement ID: EDMS-25

The branch/office home page shall display documents rejected in the Record Centre

Verification Method: Test

Requirement ID: EDMS-26

The branch/office home page shall display documents awaiting approval

Verification Method: Test

3.5.2.3.3 Record Center

Requirement ID: EDMS-27

EDMS shall implement one Record Center per command using the SharePoint 2013 out-of-the-box functionality

Verification Method: Test

Requirement ID: EDMS-28

The Record Center template shall be enriched with NCMS metadata in line with the NIP (i.e: Date Disposition Keywords Publisher Owner)

Verification Method: Test

Requirement ID: EDMS-29

EDMS shall provide a ""Record Centre Manager"" role with elevated privileges over the content of the record center.

Verification Method: Test

Requirement ID: EDMS-30

Workflow. EDMS shall implement a Workflow for Publishing Documents in the Record Center coherent with the existing EDMS workflow.

Verification Method: Test

Requirement ID: EDMS-31

EDMS shall allow users to send a request for storing a document in the record center commensurate with the requesting user's permissions in accordance with the prescribed workflow.

Verification Method: Test

Requirement ID: EDMS-32

A workflow shall manage the review and approval (or rejection) of documents sent to the record center

Verification Method: Test

Requirement ID: EDMS-33

EDMS shall provide the mechanism to archive documents in PDF format while preserving a copy of the original document format (i.e.: in a hidden store as EDMS)

Verification Method: Test

3.5.2.3.4 EDMS Managed Metadata

Requirement ID: EDMS-34

EDMS shall leverage the functionality for management of metadata implemented in Run-Time NIP, provided by NCMS, in accordance with NATO Core Metadata Specification (NCMS) Implementation Guidance, Version 1.0 Draft 0.1, 14th January 2016.

Verification Method: Test

Requirement ID: EDMS-35

EDMS metadata shall comply with the NCMS

Verification Method: Test

Requirement ID: EDMS-36

EDMS shall re-use the existing NIP metadata

Verification Method: Test

Requirement ID: EDMS-37

EDMS shall allow extensions coherent with the NCMS guideline

Verification Method: Test

Requirement ID: EDMS-38

EDMS shall pre-fill the maximum metadata default values for documents, allowing the user to verify and make final changes.

Verification Method: Test

The Communities of Interest metadata differs from the department in that the terms are reused from the sub term layer “Department>Community”

The Shared documents Web part on the Workspace does not function correctly as a result of this.

Requirement ID: EDMS-41

The same content types shall be available as departments'

Verification Method: Test

Requirement ID: EDMS-42

Permissions shall be implemented in the department workspaces for the different access: Private Documents only members of the current department have contributor permissions and for Public Libraries all Authenticated Users can contribute.

Verification Method: Test

3.5.2.3.5 User Information

Requirement ID: EDMS-43

EDMS shall leverage the User Profile synchronisation functionality implemented in Run-Time NIP.

Verification Method: Test

3.5.2.3.6 Content Types and templates

Requirement ID: EDMS-44

In respect of EDMS, Navigation NIP Terms are re-used from the NATO Domain Group , Specifically from the “Organisational entity” term set predominantly sub term layer “Department>Command” . The following EDMS Content types shall be available in the Content Hub for NIP

Verification Method: Test

- EDMS Document
- Directive
- Letter
- Point Paper
- Spreadsheet
- Presentation

Requirement ID: EDMS-45

The Communities of Interest metadata shall be similar to the department metadata except that the terms are reused from the sub term layer “Department>Community”

Verification Method: Test

- The Shared documents Web part on the Workspace does not function correctly as a result of this.
- The same content types are available as departments
- Permissions reflect department workspaces (e.g. Private Documents libraries have Anonymous access disabled)

Requirement ID: EDMS-46

EDMS shall provide with the content types and templates equivalent to the current EDMS document templates in SHAPE, including but not limited to:

Verification Method: Test

- EDMS shall include a content type for "Military Letter"
- EDMS shall include a content type for "Memo"
- EDMS shall include a content type for "Directive"
- EDMS shall include a content type for "Document"
- EDMS shall include a content type for "Personal Letter"

Requirement ID: EDMS-47

The templates shall retrieve metadata from the original uploaded document, including but not limited to:

Verification Method: Test

- EDMS shall automatically populate the creation date for newly created content
- EDMS shall automatically populate the author metadata with the identity of the user creating a new document
- EDMS shall automatically populate the pre-defined security classification metadata element when creating new content
- Mandatory fields, as described in the metadata mappings, shall be auto-populated, with zero user-interaction, unless required by the user.

3.5.2.3.7 Versioning and CMS

Requirement ID: EDMS-48

EDMS Document Libraries shall have major versioning enabled by default

Verification Method: Test

Requirement ID: EDMS-49

EDMS Document Libraries shall have minor versioning enabled by default

Verification Method: Test

Requirement ID: EDMS-50

EDMS Document Library shall be configured to retain a predefined number of major versions and a predefined number of minor versions by default

Verification Method: Test

Requirement ID: EDMS-51

EDMS system shall enable users to restore prior versions of a document

Verification Method: Test

Requirement ID: EDMS-52

EDMS shall display the version history for documents

Verification Method: Test

Requirement ID: EDMS-53

EDMS shall leverage SharePoint 2013 versioning capability to manage different versions of a single document.

Verification Method: Test

3.5.2.3.8 Naming Conventions (Users, Command, Branch)

Requirement ID: EDMS-54

The Command/Department home page title shall be the long name of such Command or Department, consistent with the NIP implementation.

Verification Method: Test

3.5.2.3.9 Accessibility & Permissions

Requirement ID: EDMS-55

Each Bi-SC, Command and Branch/Office shall have public spaces where to store information available to all Users. Only the members belonging to each space can contribute on that particular space

Verification Method: Test

Requirement ID: EDMS-56

Command areas shall have a protected space for Command internal working, where only Command Users can access and contribute

Verification Method: Test

Requirement ID: EDMS-57

Branch/Office areas shall have a protected space for Branch/Office internal working, where only Branch/Office Users can access and contribute

Verification Method: Test

Requirement ID: EDMS-58

EDMS shall implement Role Based Access Control (RBAC) permission model. Enabling similar permission control as the current EDMS.

Verification Method: Test

Requirement ID: EDMS-59

Each Office, Department or Branch Site Template shall implement a Public Library that is accessible by all users of the command, consistent with their permissions.

Verification Method: Test

3.5.3 Tasker Tracker Plus (TT+)

TT+ is an application built on top of SharePoint 2013. The application leverages and extends the capabilities of SharePoint by deploying several TT+ core packages and TT+ extension packages to the SharePoint farm. These packages were initially created at NSHQ in Mons, BE over the past several years (then called the Project Management Tool, "PMT"). For the purposes of the TT+ rollout, these packages and solutions are to be industrialized (read: prepared to work in a standardized NATO environment) and packaged for rollout within the NATO static command structure throughout Europe and the USA. There are some modifications that have been agreed upon and included in the project scope of work that will customize PMT to function more similarly to the already existing TTE. This new version of PMT – with the industrialization changes and "TTE" customizations is what comprises the "new" application TT+. The packages mentioned above are divided into "solutions".

3.5.3.1 Functional Requirements

3.5.3.1.1 General

Tasker Tracker Plus (TT+) is a SharePoint application for managing the creation of documents in a collaborative environment with the support of a built-in workflow process.

TT+ offers the following services:

- Task/Process management for the collaborative creation of documents or collections of documents for a wide variety of purposes.
 - Workflows are based on pre-configured offices containing AD groups (populated with user accounts) for the division of work and permissions.
 - TT+ manages the process of document/task creation including and managing Task status, updates to the status, sends E-mail notifications to receivers of Task activities and provides archiving functionality.
- TT+ uses the standard SharePoint framework (i.e. Document Libraries and Lists) for the management of Activity / Tasker information and documentation (incl. versioning, auditing, metadata, etc.).
- TT+ extends the standard SharePoint functionality to encapsulate all of the necessary TT+ functionality into one place (i.e. Site Collection) and leverage the customization options within SharePoint to deliver the required functionality. Using pre-existing SharePoint Application Programming Interfaces (APIs), TT+ maintains the “feel” of SharePoint and reduces the overall amount of custom code required, ensuring fewer security risks and reduced maintenance effort.
- TT+ includes reporting, document archiving features that have been developed based on “best practices” gathered from other NATO applications (i.e. Tasker Tracker Enterprise (TTE)) and requirements from a wide range of users (i.e. NATO static command, NSHQ).
- TT+ leverages the SharePoint framework including client and server integration components to create an easily understandable and efficient (read: fast) application that can be customized further through very flexible configuration options using SharePoint standards (i.e. configuration mostly through items in SharePoint lists).

3.5.3.1.1.1 Integration

Requirement ID: TTP-1

The IKM Tools shall leverage the ITM provided Chat and Presence Services, being Microsoft Skype for Business or Microsoft Teams.

Verification Method: Test

Requirement ID: TTP-2

The IKM Tools shall integrate with the ITM Share Point delivered platform, including with the ITM subservices for:

Verification Method: Test

Requirement ID: TTP-3

The TT+ application shall be installable via a scriptable and automated process.

Verification Method: Test

Requirement ID: TTP-4

Parameters for the installation shall be managed through the scripted installation files.

Verification Method: Test

Requirement ID: TTP-5

TT+ shall be able to be integrated in the infrastructure monitoring.

Verification Method: Test

Requirement ID: TTP-6

Microsoft best practices shall be used for the development to allow further improvement and bug fixing.

Verification Method: Test

Requirement ID: TTP-8

TT+ shall be able to integrate with EDMS.

Verification Method: Test

Requirement ID: TTP-9

EDMS shall be able to transfer a document within a specified tasker.

Verification Method: Test

3.5.3.1.1.2 High level design

The logical infrastructure of TT+ is described as follows:

TT+ is installed on an existing SharePoint 2013 farm in a pre-existing “WebApp” containing a Site Collection, in which TT+ is created. This Site Collection consists of various Lists and Document Libraries connected with code. TT+ can be configured in Microsoft’s Internet Information Services as either Host Named or Path Based Site Collections, allowing more flexibility and deployment environment options.

Requirement ID: TTP-10

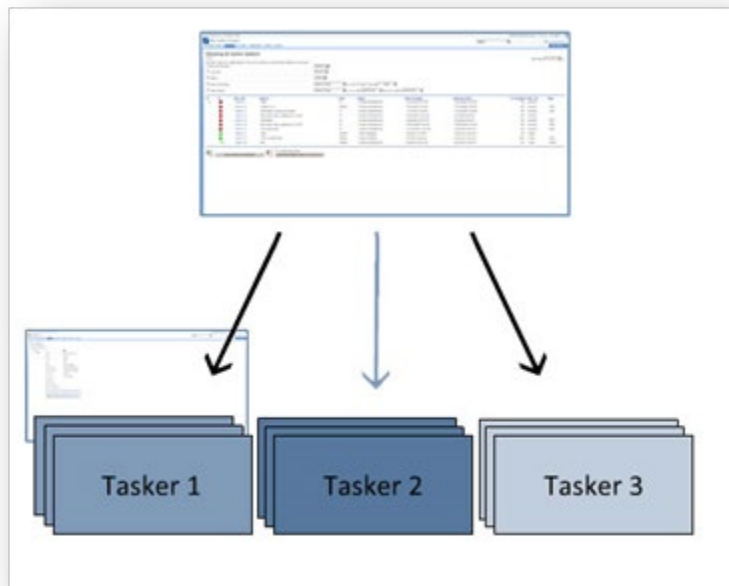
Each Command shall have a TT+ instance they can manage and operate.

Verification Method: Test

Requirement ID: TTP-11

Each TT+ instance shall be able to have multiple Taskers, see the following diagram:

Verification Method: Test



The hierarchy is as follows:

- Each TT+ instance is a Site Collection:
- There is a “Rootweb”, which contains:
 - Configuration lists and libraries
 - The User Interface (UI) for TT+ configuration
 - Configuration Webs, which contain:
 - The configuration lists
 - And are used for workflow setup per TT+ Activity Type
 - Activities (like Taskers) are stored in a central list
 - For each Activity, a workspace is created and connected, which contains:
 - Roles
 - Actions
 - Members

See the following diagram:

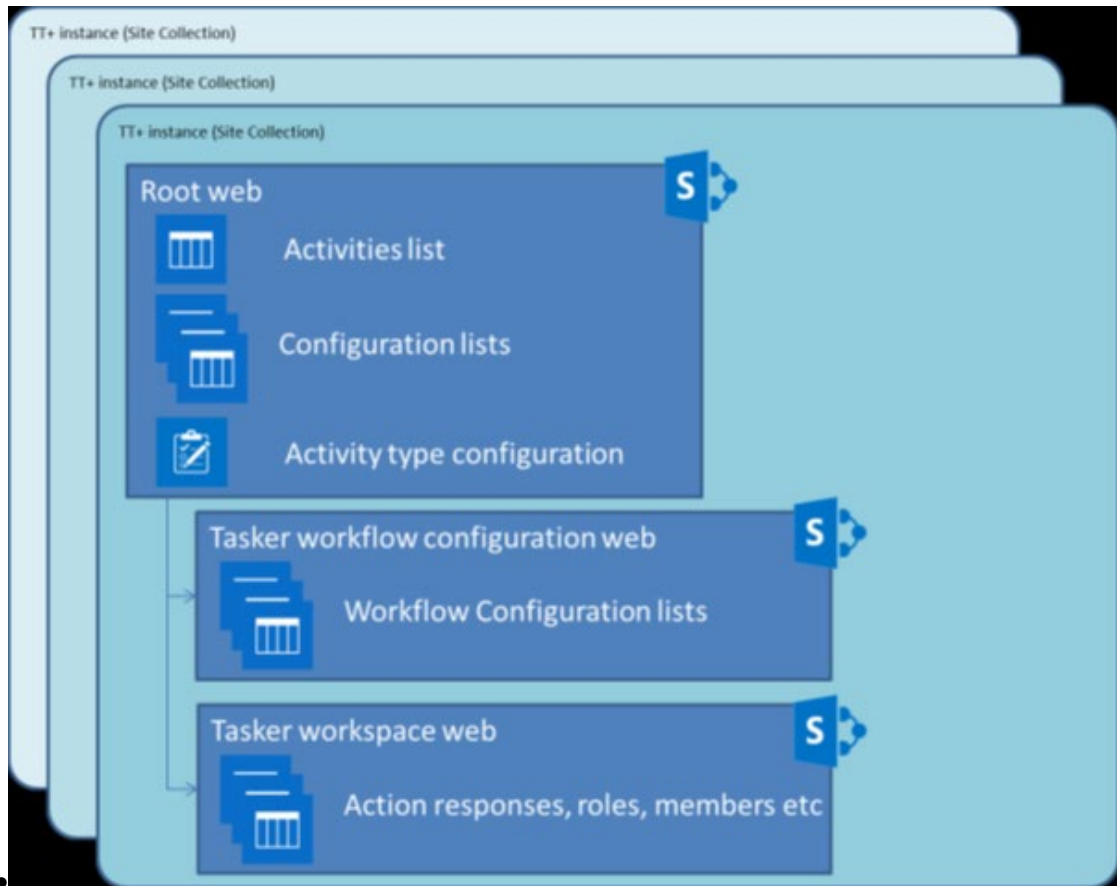


Figure 16 Farm Topology

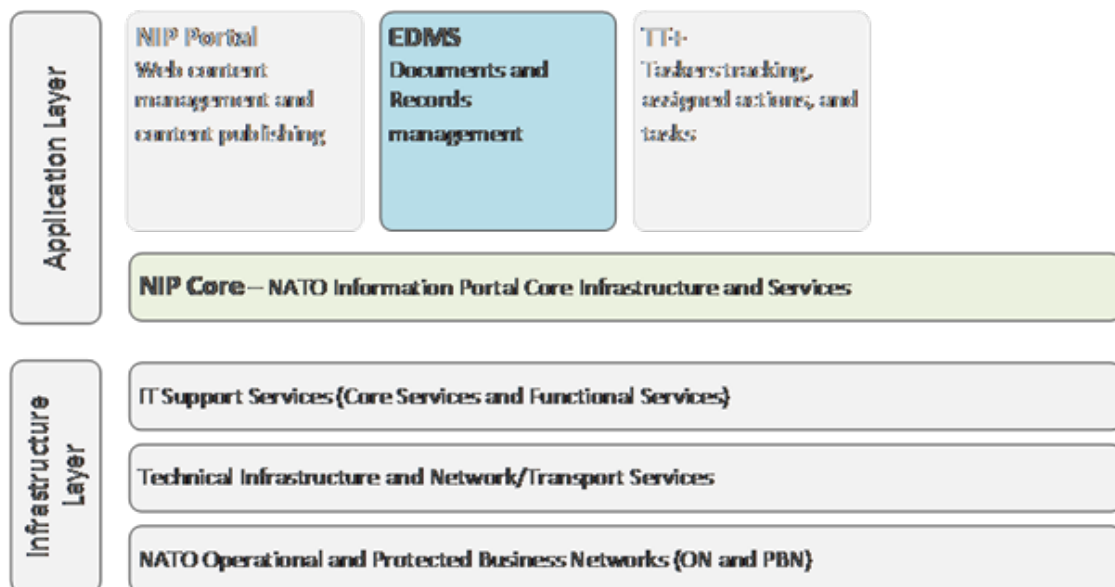


Figure 17 High Level Design

3.5.3.1.2 Tasker as collaborative workflow

Requirement ID: TTP-12

The status of the Tasker shall be updated and the various workflow steps are completed. The different Tasker status are defined based on the linear workflow for TT+, which result from the definition of the Roles within the Tasker, see the following Tasker workflow diagram:

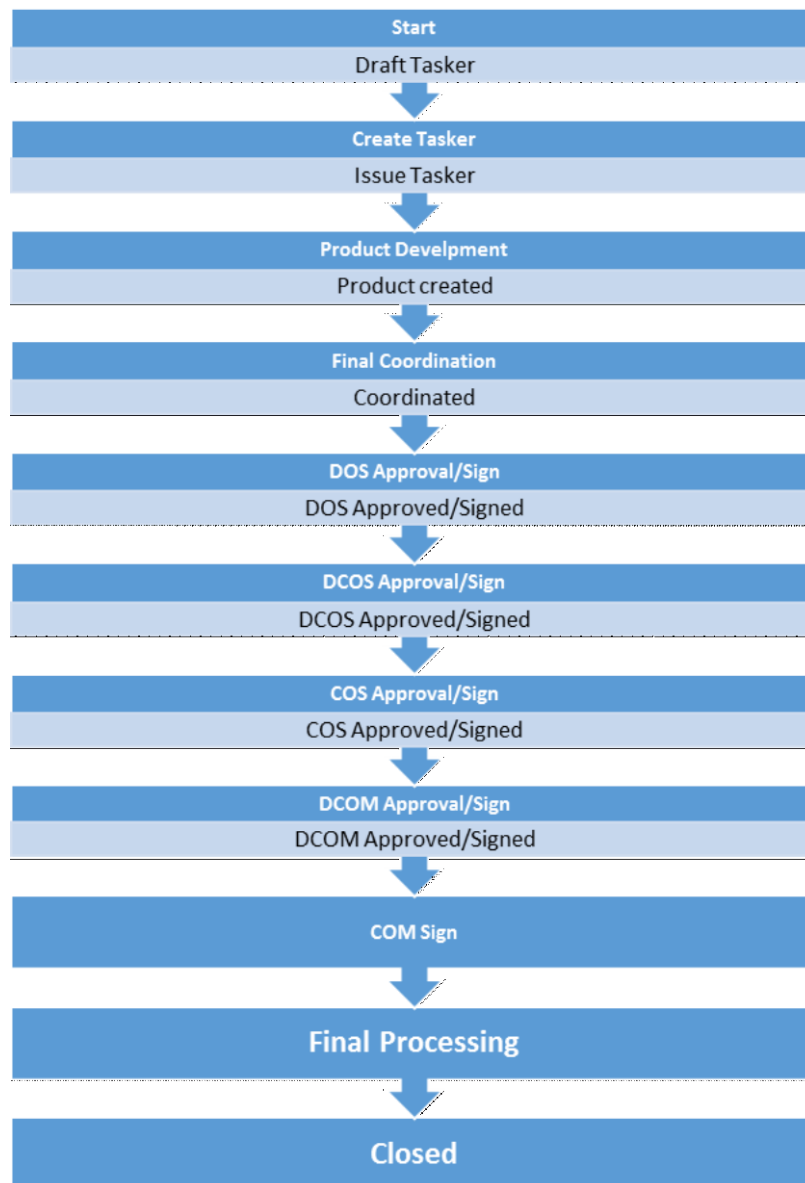
Verification Method: Test

Figure 18 Tasker workflow steps

Requirement ID: TTP-13

A tasker workflow shall be configurable to include more steps, offices and status

Verification Method: Test

3.5.3.1.2.1 Organization structure*Requirement ID: TTP-14*

The TT+ organizational structure shall include a set of:

Verification Method: Test

- Roles (grouped by different level of Offices)
- Assigned Actions to each role
- Offices and
- Display Panels (where the offices must be grouped and presented to users in the Tasker form)

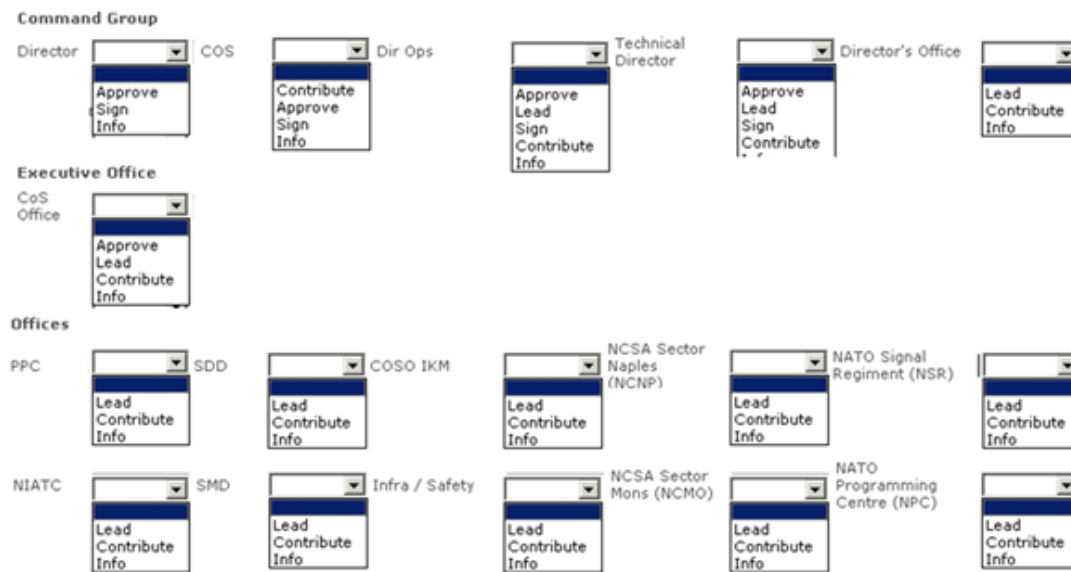


Figure 19 Tasker form panel Office Organization

Requirement ID: TTP-15

The organization structure shall be configurable.

*Verification Method: Test**Requirement ID: TTP-16*

The Roles shall be associated with a specific level of “Office Roles”, commonly known as “Office Level”, and each role can be associated with one Tasker status and one or more Action Responses

*Verification Method: Test**Requirement ID: TTP-17*

For display purposes in Tasker Form, panels shall group offices by their “Office Roles” level

Verification Method: Test

Requirement ID: TTP-18

Each office shall be assigned an “Office Roles” level and will be displayed in Tasker Form according to that level. An override mechanism may be used by selecting directly in the Office list the display panel where the Office should appear

Verification Method: Test

Requirement ID: TTP-19

The configuration of all Tasker workflow elements (Offices, Roles etc.) shall comply with their defined relationship, so that Offices have roles associated, roles have status associated and action response defined. See figure below:

Verification Method: Test

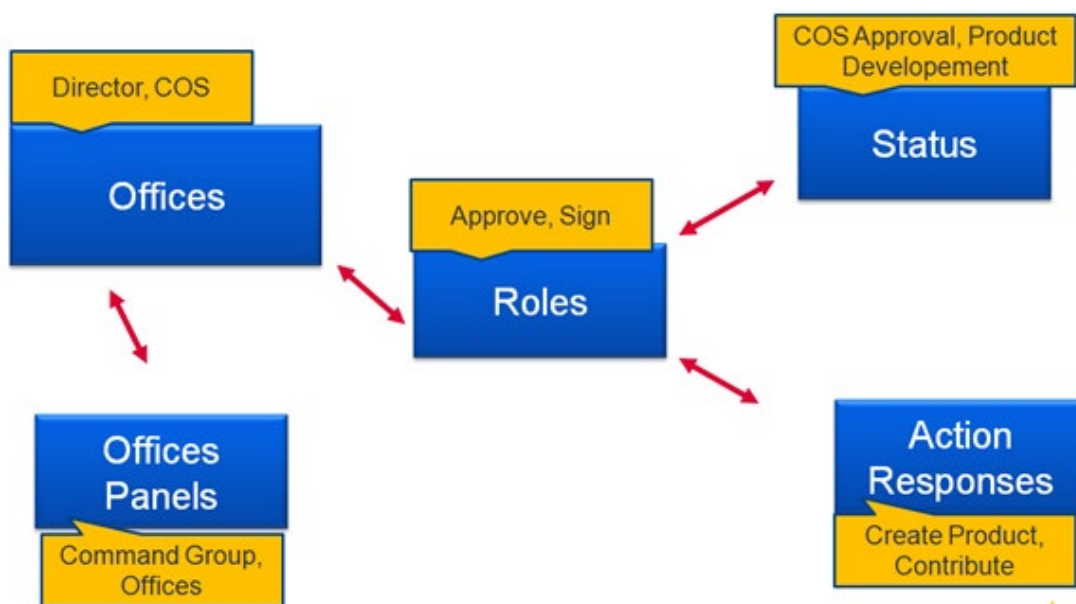


Figure 20 Relationship in Tasker elements

3.5.3.1.3 Search

Requirement ID: TTP-20

The IKM Tools shall leverage existing search services provided by NIP when present and also integrate with the SOA and IdM Platform Information Search Services.

Verification Method: Test

3.5.3.1.4 Functionality

TT+ is an application built on top of SharePoint 2013. The application leverages and extends the capabilities of SharePoint by deploying several TT+ core packages and TT+ extension packages to the SharePoint farm. These packages were initially created at NSHQ in Mons, BE over the past several years (then called the Project Management Tool, “PMT”). For the purposes of the TT+ rollout, these packages and solutions are to be industrialized (read: prepared to work in a standardized NATO environment) and packaged for rollout within the NATO static command structure throughout Europe and

the USA. There are some modifications that have been agreed upon and included in the project scope of work that will customize PMT to function more similarly to the already existing TTE. This new version of PMT – with the industrialization changes and “TTE” customizations is what comprises the “new” application TT+. The packages mentioned above are divided into “solutions”, which the final files are created to be installed on the SharePoint farm. The following sections contains the details of these solutions.

Requirement ID: TTP-24

Integration of External Web Services. TT+ shall be able to integrate with external web services through server or client integration

Verification Method: Test

Requirement ID: TTP-25

Integration of External Applications. TT+ shall allow connection of external applications through the SharePoint API and .NET client integration components

Verification Method: Test

Requirement ID: TTP-26

Set Date/Time Format Used For The Whole Instance. TT+ shall be able to reuse a configurable date and time format on Site Collection level to set/reset the date/time of the whole TT+ instance.

Verification Method: Test

Requirement ID: TTP-27

Infrastructure. TT+ shall be able to be installed as a stand-alone application within a standard ITM version SharePoint farm

Verification Method: Test

Requirement ID: TTP-28

Infrastructure. TT+ shall be compatible with being installed into an existing SharePoint environment as a dedicated Web Application

Verification Method: Test

Requirement ID: TTP-29

Infrastructure. TT+ shall be compatible with being installed into an existing SharePoint environment and shall be able to consume global metadata from an existing term store

Verification Method: Test

Requirement ID: TTP-30

Archive Function. TT+ shall be able to archive a closed activity out of the operational system by converting activity related metadata and documents in to a summary report document stored in a SharePoint based document archive.

Verification Method: Test

Requirement ID: TTP-31

Reporting. TT+ shall be able to generate document based reports on activities and provide a chart feature displaying overview of assigned roles per office.

Verification Method: Test

Requirement ID: TTP-32

Office Inbox. TT+ shall provide an Office Inbox feature to show users the assigned activities to a specific office.

Verification Method: Test

Requirement ID: TTP-33

Activity List. TT+ shall have a central location to display all the currently available activities in a commands TT+ instance and provide users the possibility to filter the displayed list content.

Verification Method: Test

Requirement ID: TTP-34

Error Handling. TT+ shall handle errors and log them in a centralised error log.

Verification Method: Test

Requirement ID: TTP-35

External Integration Component. TT+ shall provide the possibility to interact with external applications using SharePoint OOTB APIs and web service functionality.

Verification Method: Test

Requirement ID: TTP-36

Metadata. TT+ shall be able to use a combination of NCMS and NIP based metadata and extended TT+ required metadata. Metadata fields shall be based on SharePoint columns.

Verification Method: Test

Requirement ID: TTP-37

Search. TT+ shall be able to integrate with a SharePoint 2013 search engine.

Verification Method: Test

Requirement ID: TTP-38

Notification/Mail Functionality. TT+ shall send notification messages to members involved in an activity / when a subtask is assigned to a user / when an office has been assigned a role.

Verification Method: Test

Requirement ID: TTP-88

TT+ shall send notification when an action is completed in a Tasker to the next office in line, notifying that office that their action is now required, excluding "Info" action.

Verification Method: Test

Requirement ID: TTP-39

Security Classification. TT+ shall allow a user to assign a security classification to an activity.

Verification Method: Test

Requirement ID: TTP-40

Content Types. TT+ shall use a set of content types.

Verification Method: Test

Requirement ID: TTP-41

Search Results Security Trimming. TT+ search results shall be security trimmed.

Verification Method: Test

Requirement ID: TTP-42

Metadata. TT+ shall allow users to edit metadata of a draft or issued activity item through a SharePoint user interface.

Verification Method: Test

Requirement ID: TTP-43

Sub-Tasking. TT+ shall allow a user to be able to delegate activities through creating a subtask within a tasker. The user shall be able to assign subtasks or create a new top-level subtask.

Verification Method: Test

Requirement ID: TTP-44

Edit Action Responses. TT+ shall allow users to select an action response for their related role

Verification Method: Test

Requirement ID: TTP-45

Activity Lifecycle / Change Status. TT+ shall proceed an activity through the activity lifecycle from draft till closed (and archived) if actions linked to the current status are finished. A tasker owner shall be able to manually cancel or suspend an activity.

Verification Method: Test

Requirement ID: TTP-46

Simultaneous Editing of Activity. TT+ shall allow multiple users to work simultaneously on different areas in an activity.

Verification Method: Test

Requirement ID: TTP-47

Documents. TT+ shall provide a SharePoint document library that allows only Tasker's users to upload and contribute to documents belonging to a specific activity

Verification Method: Test

Requirement ID: TTP-48

Reporting. TT+ shall be able to generate a configurable report of an activity.

Verification Method: Test

Requirement ID: TTP-49

Links. TT+ shall provide users the possibility to add links as part of an related to activities

Verification Method: Test

Requirement ID: TTP-50

Delete Activity. TT+ shall provide users the possibility to delete activities and their related workspace

Verification Method: Test

Requirement ID: TTP-51

Tasker History. TT+ shall include a history list as part of an activity to track role assigned roles, action response and workflow processing

Verification Method: Test

Requirement ID: TTP-52

Create Workspace. TT+ shall allow users to create a workspace for an activity type. Allowing the activity creation and approval similarly to the TTE so that there are user roles defined for issuing and approving an activity.

Verification Method: Test

Requirement ID: TTP-53

Draft Activity. TT+ shall allow users to create a draft version of an activity.

Verification Method: Test

Requirement ID: TTP-54

Issue Activity. TT+ shall allow users to issue an activity either directly from the creation form or from a draft activity.

Verification Method: Test

Requirement ID: TTP-55

Permission Control. TT+ shall allow users to assign and revoke permissions for each individual activity. Either by using pre-defined active directory permission groups tied to an assigned office or by manual interaction.

Verification Method: Test

Requirement ID: TTP-56

Instance. TT+ shall have configurable settings throughout a Command's TT+ instance. TT+ shall provide application level configuration: activity configuration, field access, list validation, and activity requests.

Verification Method: Test

Requirement ID: TTP-57

Activity Types. TT+ shall be able to configure different types of activities in order to manage multiple projects types

Verification Method: Test

Requirement ID: TTP-58

Instance of activity type (e.g. Tasker). For each activity type, TT+ shall be capable of configuring its own workflow configuration, activity related roles, offices, default activity access and pre-defined assigned actions.

Verification Method: Test

Requirement ID: TTP-59

Archiving. TT+ shall provide the possibility to configure an archive location as part of a commands instance configuration.

Verification Method: Test

Requirement ID: TTP-60

TT+ shall provide cross site tasking functionality as follows:

Verification Method: Test

- An authorized user in a Command creates an Office representing the remote Command to task (i.e. in ACT Tasker creates SHAPE Office). That office has a "sweeper" staff or representative of the Command.
- The authorized user then Tasks that office in the Tasker
- The sweeper receives the Task and then subtasks as necessary in his Command
- When Task is finished the sweeper updates the Task in the Original Command

Requirement ID: TTP-61

TT+ shall be able to handle Simultaneous editing of taskers

Verification Method: Test

Requirement ID: TTP-62

By default, all taskers' metadata shall be visible to everyone

Verification Method: Test

Requirement ID: TTP-63

TT+ shall provide a user the ability to create a "Close hold" Tasker, so that only member of the Close Hold group can see and modify the Tasker.

Verification Method: Test

Requirement ID: TTP-64

TT+ shall allow a tasker drafter to restrict a new Tasker to only key users of the offices involved.

Verification Method: Test

Requirement ID: TTP-65

TT+ shall provide a configurable Prioritisation indicator on Taskers

Verification Method: Test

Requirement ID: TTP-66

TT+ shall provide a configurable "Office inbox"

Verification Method: Test

Requirement ID: TTP-67

All visual references to PMT shall be replaced by "TT+"

Verification Method: Test

Requirement ID: TTP-68

TT+ shall allow a user with appropriate permissions to create a Tasker from a document stored in EDMS

Verification Method: Test

Requirement ID: TTP-69

TT+ shall allow external services to store the URL of the tasker initiation document. (Create field to foresee previous requirement)

Verification Method: Test

Requirement ID: TTP-70

TT+ shall provide a configurable "My tasks page"

Verification Method: Test

Requirement ID: TTP-71

TT+ shall provide every user the functionality to save Favourite users

Verification Method: Test

Requirement ID: TTP-72

TT+ sub tasking shall leverage Favourite users as follows:

- A user can select 1 or any of their favourite users
- A user can add a member to the list
- A user can remove a member from the list
- A confirmation screen pops up for any added member

Verification Method: Test

Requirement ID: TTP-73

TT+ 'adding a member' shall leverage Favourite users

Verification Method: Test

Requirement ID: TTP-74

TT+ shall provide a centralised Help Centre

Verification Method: Test

Requirement ID: TTP-75

TT+ shall allow a user to send a Tasker Product to the external documents landing zone

Verification Method: Test

Requirement ID: TTP-76

The selected task shall be highlighted on the sub tasks tree

Verification Method: Test

Requirement ID: TTP-77

TT+ shall provide a configurable Business Intelligence (BI) Reporting component

Verification Method: Test

Requirement ID: TTP-78

TT+ shall provide a configurable Time Left indicator on Taskers (red, yellow and green)

Verification Method: Test

Requirement ID: TTP-79

TT+ shall provide a robust 'Mail All Members' functionality for every Tasker

Verification Method: Test

Requirement ID: TTP-80

TT+ shall allow a user to clone another Tasker

Verification Method: Test

Requirement ID: TTP-81

TT+ shall provide a comprehensive history for every Tasker

Verification Method: Test

3.5.3.1.4.1 Core metadata for TT+

The definition of agreed metadata is vital for the finalisation of the TT+ configuration, installation routines, preparation for the NATO IV&V processes and data migration purposes among other areas of importance. The following list contains the expected metadata fields that TT+ will implement, which can be used to tagging purposes. This list has been communicated with the NCIA for several months and this is the current version as of the submission date of this document. Any changes will require further review and might require significant effort on the part of the Contractor. In such cases, an Engineering Change Proposal (ECP) or Change Request (CR) as defined by NATO standard processes could be required.

TT+ Tagging Metadata list			
TT+ Metadata	Mandatory	Internal Name	Field Type
Background	FALSE	PMT_Background	Note
HQ Position	FALSE	PMT_HQPosition	Note

Instructions	FALSE	PMT_Instructions	Note
Funded	FALSE	PMT_Funded	Boolean
Needed By	FALSE	PMT_NeededByDate	DateTime
Participants	FALSE	PMT_Participants	Note
Recommendations	FALSE	PMT_Recommendations	Note
Scope	FALSE	PMT_Scope	Note
Revision Date	FALSE	PMT_RevisionDate	DateTime
Contribution Due Date	FALSE	PMT_ContributionDueDate	DateTime
Coordination Due Date	FALSE	PMT_CoordinationDueDate	DateTime
Date Signed	FALSE	PMT_DateSigned	DateTime
Due Date	FALSE	PMT_DueDate	DateTime
End Date	FALSE	PMT_EndDate	DateTime
Start Date	FALSE	PMT_StartDate	DateTime
Suspense Date	FALSE	PMT_SuspenseDate	DateTime
Target Completion Date	FALSE	PMT_TargetCompletionDate	DateTime
Views of others	FALSE	PMT_ViewsOfOthers	Note
Priority	FALSE	PMT_Priority	TaxonomyFieldType
Security Classification	TRUE	PMT_SecurityClassification	TaxonomyFieldType
Action Officer	FALSE	PMT_ActionOfficer	User
Initiating Office	FALSE	PMT_InitiatingOffice	Lookup
Country Code	FALSE	PMT_ISO3_CountryCode	Text

Figure 21 TT+ Tagging Metadata List

Requirement ID: TTP-82

Consume External Managed Metadata Server. TT+ shall be able to integrate with an external SharePoint 2013 based managed metadata service.

Verification Method: Test

Requirement ID: TTP-83

Consume External Content Type Hub. TT+ shall be able to reuse content types that are being provided through a SharePoint 2013 based content type hub

Verification Method: Test

3.5.3.1.4.1.1 Dependencies

Requirement ID: TTP-84

The following list catalogues the baseline of TT+. Once installed, these features shall not be changed/updated without going through formal change procedures and including all testing and approval processes. Changing features for the various activities and activity request metadata and content types is very critical and not foreseen. Additionally, the various list definitions for activities and activity requests should not be changed once installed. This is specifically

mentioned as these points can be changed by system administrators and users with elevated access privileges (i.e. “FuncAdmins”).

Verification Method: Test

- The current baseline is based on the core functionalities of Tasker Tracker and PITT²:

² *Legacy software used before PMT or TTE.*

1. Core metadata for TT+
2. Core TT+ list and views
 - Activity request
 - Activities
 - Office levels
 - Offices
 - Notification Messages
 - Office templates
 - Dependencies
3. Core TT+ pages and web parts
 - Shared Documents
 - Activity Plan
 - Roles
 - Actions
 - Service
4. Core TT+ configuration lists
 - Approval Routing
 - Default activity access
 - Semantics
 - Configuration
 - Activity prefixes
 - Country Codes
5. Configuration sites: every activity type can have its own configuration site:
 - Activity states list
 - Roles list
 - Actions list
 - Office groups list
 - Fixed actions
6. Reporting
 - Document Data links
 - Report templates

7. Archiving: Archiving tool using the core reporting functionalities to archive activities

- Summary report to include core information from the top level activity list, as well as the roles and action list, the project plan list, history and document library overview
- This summary report will be stored together with the activity related document in a folder/document set
- The activity item will be linked to this report/folder, the site will be deleted

Note: Functional metadata i.e. required metadata for an Activity workflow will be part of the TT+ core components. Remaining fields provided by the NATO Core Metadata Standard ("NCMS") will be integrated into the document metadata used in Document Libraries.

Note: The Archiving Feature can be implemented in several different scenarios, i.e. in a separate WebApp or Site Collection/Content Database. Archiving old and closed Activities allows the administrator to remove non-active Activities from the production area, reducing the impact of storage and system performance and also allows the administrator the option of moving the data to less expensive (i.e. slower) hardware and storage, as these Activities will not be accessed as often.

Requirement ID: TTP-85

Summary report shall include core information from the top level activity list, as well as the roles and action list, the project plan list, history and document library overview

Verification Method: Test

Requirement ID: TTP-86

This summary report shall be stored together with the activity related document in a folder/document set

Verification Method: Test

Requirement ID: TTP-87

The activity item shall be linked to this report/folder, the site will be deleted

Verification Method: Test

4 Non-functional Requirements

The Non-Functional Requirements (NFR) repository categorizes system/software product characteristics which cannot be defined as "functional".

For IKM Tools the Non-functional Requirements repository will contain the following requirements categories:

- Service Criticality (section 4.1)
- System quality (section 4.2)
- Compatibility - Interoperability (Section 4.3)

- Design constraints (section 4.4)
- Technical Documentation Requirements (section 4.5)
- Computer Resource Constraints (section 4.6)

4.1 Service Criticality

The IKM Tools services can be grouped into three categories based upon their level of criticality to the overall effectiveness of the IKM Tools:

- Level 1: IKM Tools cannot be considered to be functional without these services running (Critical)
- Level 2: The IKM Tools can operate without these services, but its effectiveness is degraded (Important)
- Level 3: These services provide value-add, but the IKM Tools can be used effectively without them (Standard)

The following table illustrates which IKM Tools services fall into each category. This categorization is used as a guideline for developing the Non-Functional Requirements and necessary service levels for the IKM Tools.

Service	Critical Service (L1)	Important Service (L2)	Standard Service (L3)
NIP	X		
EDMS	X		
TT+	X		
Workflow Application	X		
Workspace Application		X	
Search	X		
Analytics			X
Cross Domain			X
Distribution and Archiving			X

Table 2 Service Criticality Levels

4.2 System Quality

The System Quality section of Non Functional Requirements (NFR) categorizes system/software **product quality**.

The quality of a system is the degree to which the system satisfies the stated and implied needs of its various stakeholders, and thus provides value. These stated and implied needs are represented by quality models that categorize product quality into characteristics, which in some cases are further subdivided into sub-characteristics. (Some sub-characteristics are divided into sub-sub-characteristics.) This hierarchical decomposition provides a convenient breakdown of product quality.

Characteristic definitions in this section are based on ISO/IEC 25010:2011(E) - System and software quality models.

A tailoring of the standard have been made to assure that the Quality Characteristics necessary for this specific project are correctly selected and defined, in accordance to chapter 3.5 of the Standard.

The quality of a product can be seen in many different way, depending on the stakeholder point of view.

In this case, the stakeholders view to be used is depending on the **Primary and Secondary Users (administrators, maintainers, etc.)** point of view, therefore, in accordance with the ISO 25010 standard the quality model should be tailored on this stakeholder.

The following table shall be considered in reading this section:

Product Quality Characteristic	Influence on Quality (Primary Users)	Influence on Quality (Maintenance Tasks)	Influence on Quality (Other Stakeholders' Concerns)
Performance Efficiency	Yes		Yes
Reliability	Yes		Yes
Availability	Yes	Yes	
Fault Tolerance		Yes	
Recoverability	Yes	Yes	
Portability		Yes	
Adaptability		Yes	
Maintainability		Yes	Yes
Modularity		Yes	
Analysability		Yes	
Testability	Yes	Yes	

Table 3 Quality factors influence

4.2.1 Measuring the quality characteristics

Requirement ID: IKM-SRS-267

For monitoring the quality characteristics of the system some definition of when a system is not correctly performing shall be given.

Verification Method: Analysis

For the IKM Tools the following definition shall be applied:

Error: A design flaw or malfunction that causes a Failure of one or more Configuration Items. A mistake made by a person or a faulty Process that affects a CI is also an Error (human Error). For Platforms all the Human error shall not be taken into consideration in measuring the quality performances.

Fault: see Error

Failure: Loss of ability to Operate to Specification, or to deliver the required output. The term Failure may be used when referring to Services, Processes, Activities, Configuration Items, etc.

Problem: A cause of one or more Incidents. The cause is not usually known at the time the incident happens.

4.2.2 Performance Efficiency

Performance Efficiency is the performance relative to the amount of resources used under stated conditions. Resources can include other software products, the software and hardware configuration of the system, and materials (e.g., print paper, storage media)

4.2.2.1 Capacity

Degree to which the maximum limits of a product or system parameter meet requirements.

NOTE Parameters can include the number of items that can be stored, the number of concurrent users, the communication bandwidth, throughput of transactions, and size of database.

Requirement ID: IKM-SRS-268

The IKM Tools shall allow to operate to 30,000 users in the Data Center mode (authenticated and anonymous users) and 1,000 users in the Standalone mode

Verification Method: Test

Requirement ID: IKM-SRS-269

The IKM Tools shall allow the concurrent execution of ALL IKM Tools components by 6,000 users in DC mode and meet the performance objectives for these functions.

Verification Method: Test

Requirement ID: IKM-SRS-270

The IKM Tools shall support 20 % concurrency (of total users) considering a 50 request/hour workload

Verification Method: Test

Requirement ID: IKM-SRS-271

The IKM Tools shall allow at least 300 TB of storage capacity for Data Center mode and 2 TB of storage capacity for Standalone mode.

Verification Method: Analysis

Requirement ID: IKM-SRS-272

When the maximum number of allowed concurrent user is using the system, there shall not be any error/fault 99,5 % of the operational time.

Verification Method: Test

4.2.2.2 Resource Utilization

Degree to which the amounts and types of resources used by a product or system, when performing its functions, meet requirements.

Requirement ID: IKM-SRS-273

During normal IKM Tools utilization, the system shall not foresee any memory error/fault for 99% of the operational time.

Verification Method: Test

Requirement ID: IKM-SRS-274

The IKM Tools Search shall perform the re-indexing without any degradation of other IKM Tools.

Verification Method: Test

4.2.2.3 Time Behaviour

Degree to which the response and processing times and throughput rates of a product or system, when performing its functions, meet requirements.

Requirement ID: IKM-SRS-275

The IKM Tools functionality: web pages load, button click reaction and general user interaction with the IKM Tools GUI shall be available for an authorised user within 1 second the 95% of the times and within 2 seconds the 100% of the times. The time will be calculated from the instant that the user hits the button to the complete rendering of the page on the client machine (in order to measure the “end-to-end user experience”), with at least 50 items showed in the page (documents, list items, events, etc.)

Verification Method: Test

Requirement ID: IKM-SRS-276

The IKM Tools shall execute the log-in and log out functions within 2 seconds (excluding dependant ADFS services execution time).

Verification Method: Test

Requirement ID: IKM-SRS-277

The IKM Tools web services shall respond to authorised users within 0.1 seconds of submitting the request the 95% of the times and within 0.2 seconds the 100% of the times. The time will be calculated from the instant that the request is arrived to the server to the instant that the servers sends the response.

Verification Method: Test

Requirement ID: IKM-SRS-278

The IKM Tools search services shall respond within 2 seconds of submitting the search query the 95% of the times and within 3 seconds the 100% of the times. The time will be calculated from the instant that the user hits the button to the complete rendering of the page on the client machine (in order to measure the “end-to-end user experience”), with at least 50 search results and at least 20% of the users performing concurrently different searches.

Verification Method: Test

4.2.3 Scalability

Scalability is defined as the capability of a system to increase (or decrease) total throughput under an increased load when resources (typically hardware) are added (or subtracted), so the scalability quality figures are defined accordingly

Requirement ID: IKM-SRS-279

The IKM Tools shall be able to support a throughput increase of 10% every year with a response time degradation of not more than 5%.

Verification Method: Analysis

Requirement ID: IKM-SRS-280

The IKM Tools shall be Horizontal Scalable by allowing the deployment of system components on different instances.

Verification Method: Analysis

Requirement ID: IKM-SRS-281

The IKM Tools shall be Vertical Scalable.

Verification Method: Analysis

4.2.4 Maintainability

Degree of effectiveness and efficiency with which a product or system can be modified by the intended maintainers.

Modifications can include corrections, improvements or adaptation of the software to changes in environment, and in requirements and functional specifications. Modifications

include those carried out by specialized support staff, and those carried out by business or operational staff, or end users.

Maintainability includes installation of updates and upgrades.

Maintainability can be interpreted as either an inherent capability of the product or system to facilitate maintenance activities, or the quality in use experienced by the maintainers for the goal of maintaining the product or system.

4.2.4.1 General

MTTR is the mean time for the system to be repaired after a failure.

MaxTTR is defined as the maximum time required to perform a maintenance action.

Service Type	MTTR	MaxTTR
Level 1	2 hours	4 hours
Level 2	4 hours	8 hours
Level 3	7 hours	24 hours

Table 4 Maintainability by Service Level

Requirement ID: IKM-SRS-282

The IKM Tools shall provide a Mean Time To Repair (MTTR) according to the Table 3 Maintainability by Service Level.

Verification Method: Test

Requirement ID: IKM-SRS-283

The MaxTTR for the IKM Tools shall not exceed the times stated in the Table 3 Maintainability by Service Level.

Verification Method: Analysis

4.2.4.2 Modularity

Degree to which a system or computer program is composed of discrete components such that a change to one component has minimal impact on other components

Requirement ID: IKM-SRS-284

IKM Tools shall be composed of discrete components such that a change to one component has minimal impact on other components, specifically: IKM Tools Framework, NIP, EDMS, TT+, Workspace and Workflow.

Verification Method: Analysis

Requirement ID: IKM-SRS-285

IKM Tools shall allow to update and deploy individual services and components without the need to re-install the full IKM Tools.

Verification Method: Test

Requirement ID: IKM-SRS-285b

IKM Tools shall allow to update and deploy individual services and components independently to each IKM tool, so that the update in one IKM Tool doesn't impact another IKM Tool.

Verification Method: Test

Requirement ID: IKM-SRS-286

The 99.9% of the time a maintenance action is required on a SW component of the IKM Tools, this action shall not cause any possible fault/error in other components of the system.

Verification Method: Analysis

Requirement ID: IKM-SRS-287

IKM Tools shall be modular enough so that the failure of one module or application (due to heavy processing or storage outage) doesn't affect the other modules.

Verification Method: Test

4.2.4.3 Analysability

Degree of effectiveness and efficiency with which it is possible to assess the impact on a product or system of an intended change to one or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identify parts to be modified.

Implementation can include providing mechanisms for the product or system to analyse its own faults and provide reports prior to a failure or other event.

Requirement ID: IKM-SRS-288

The system shall be effective and efficient in the possibility to assess the impact on a product or system of an intended change to one or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identify parts to be modified.

Verification Method: Analysis

Requirement ID: IKM-SRS-289

The system shall be able to detect the 99.5% of the possible fault/error which can occur, triggering the user with a message.

Verification Method: Analysis

Requirement ID: IKM-SRS-290

The system shall be able to diagnose the 95% of the possible fault/error which can occur, triggering the user with a message which identifies the happened failure/error.

Verification Method: Analysis

Requirement ID: IKM-SRS-291

The IKM Tools messages (e.g., error, warning, notification and informational messages) shall contain initiating module information, context sensitive help or directives on where to find answers and solutions.

Verification Method: Analysis

Requirement ID: IKM-SRS-292

The IKM Tools log messages shall contain:

Verification Method: Analysis

- initiating module information
- Date/Time(Z)
- system instance
- (log) message
- category/severity
- user (invoker of function)
- context information (like mission/session, service/function, parameters, and trace-log)

4.2.5 Reliability

Degree to which a system, product or component performs specified functions under specified conditions for a specified period of time.

4.2.5.1 General

MTBF (Mean Time Between Failures) is defined as the mean time between two consecutive faults which generate a failure.

MTBCF (Mean Time Between Critical Failures) is defined as the mean time between two consecutive faults which generate critical failures.

A critical failure is a failure which cause the complete system unavailability with consequent loss of the provided service/capability.

Requirement ID: IKM-SRS-293

IKM Tools shall exhibit a Mean-Time-Between-Failure (MTBF) as depicted in the following table:

Verification Method: Analysis

Service Type	MTBF
L1	365 days
L2	180 days
L3	30 days

Requirement ID: IKM-SRS-294

IKM Tools shall exhibit a Mean-Time-Between-Critical-Failures (MTBCF) of more than 730 consecutive days.

Verification Method: Analysis

4.2.5.2 Availability

Degree to which a system, product or component is operational and accessible when required for use.

Here considered only the Inherent Availability (Intrinsic): assumes ideal support (i.e., unlimited spares, no delays, etc.), only design related failures are considered.

4.2.5.2.1 Inherent Availability

Inherent Availability (Intrinsic) assumes ideal support (i.e., unlimited spares, no delays, etc.); only design related Failures are considered.

Requirement ID: IKM-SRS-295

The IKM Tools shall have a System Inherent Availability at Data Centres and Standalone modes (static and deployed) as depicted in the table below:

Verification Method: Analysis

Service Type	Inherent Availability
L1	99.97 %
L2	99.9 %
L3	99 %

4.2.5.3 Fault Tolerance

Degree to which a system, product or component operates as intended despite the presence of hardware or software faults.

Requirement ID: IKM-SRS-296

For the 99% of the possible fault/error in one of the system node, the system shall be able to switch to another equivalent node in less than 5 seconds without loss of data.

Verification Method: Analysis

Requirement ID: IKM-SRS-297

For the 99% of the possible fault/error in the IKM Tools access function (availability of web pages), the system shall be able to switch to an alternative web site without loss of data in less than 10 seconds (e.g.: using alternate DNS/IP entry point)

Verification Method: Analysis

Requirement ID: IKM-SRS-298

For the 99% of the possible fault/error in the IKM Tools function (availability of web pages), the IKM Tools shall be able to operate independently from each other so that if one has a downtime it doesn't affect the rest (e.g. when NIP is unavailable, EDMS, TT+, Workspaces and Workflows are still available).

Verification Method: Test

Requirement ID: IKM-SRS-299

The IKM Tools shall notify the user for potential loss/deletion of information objects during modification of any information object (e.g. by cascading deletion). When prompted by a notification about the data that might be lost/deleted, the user shall be able to choose the action that shall be taken by the system (e.g. cancel, continue).

Verification Method: Analysis

Requirement ID: IKM-SRS-300

The IKM Tools shall automatically report errors and suggested corrective actions with respect to the creation, change, exchange and storage of data elements, objects and products.

Verification Method: Analysis

Requirement ID: IKM-SRS-301

The IKM Tools messages (e.g. error, warning, notification, and informative messages) shall contain initiating module information, and contain context sensitive help and directives on where to find answers and solutions. Technical or debugging error scripts are not acceptable (e.g. "Java object 01 not accessible").

Verification Method: Analysis

Requirement ID: IKM-SRS-302

The IKM Tools shall report errors in context (e.g. given within the same page where they are encountered). An error message shall be displayed or provided in a popup. Invalid entries shall be highlighted or marked so they can be quickly identified and corrected.

Verification Method: Analysis

Requirement ID: IKM-SRS-303

The IKM Tools shall display only one error report popup screen for the same error.

Verification Method: Analysis

Requirement ID: IKM-SRS-304

The IKM Tools shall not in any case permit loss of user-entered data due to receipt of an error or other message. User input shall never be lost, discarded or corrupted unless a user actually chooses to delete or reset the input.

Verification Method: Analysis

Requirement ID: IKM-SRS-305

The IKM Tools error message content shall allow the IKM Tools System Administrator to re-create the conditions when the problem occurred (e.g. the appropriate screen and information content that caused the problem).

Verification Method: Analysis

Requirement ID: IKM-SRS-306

The IKM Tools shall be able to queue requests to an unavailable Workflow Service and deliver them when the Service becomes available again. The IKM Tools shall change its Operational State accordingly.

Verification Method: Analysis

4.2.5.4 Recoverability

Degree to which, in the event of an interruption or a failure, a product or system can recover the data directly affected and re-establish the desired state of the system.

Following a failure, a computer system will sometimes be down for a period of time, the length of which is determined by its recoverability.

The RTO (Recovery Time Objective) is the target time set for the recovery of the IKM Tools after a disaster has struck.

The RPO (Recovery Point Objective) is the maximum data loss can be recovered after a disaster has occurred. It is highly related to the backups frequency to restore the system and the latest recorded status.

Requirement ID: IKM-SRS-307

The IKM Tools shall provide the following RTO and RPO metrics:

Verification Method: Analysis

Service Type	Recovery Time Objective (RTO)	Recovery Point Objective (RPO)
L1	10 sec	8 h
L2	4 h	24 h
L3	7 h	48 h

Requirement ID: IKM-SRS-308

The IKM Tools shall queue pending asynchronous ((i.e. do not need immediate feedback) requests to an unavailable Workflow Services (e.g.: User responded action) and Workspace Services (e.g.: workspace document edit change) and deliver them when the Service becomes available again.

Verification Method: Analysis

High latency is defined as latency exceeding 700 milliseconds (SATCOM Round-Trip-Time)

Requirement ID: IKM-SRS-309

The IKM Tools shall resume/retry the IKM Tools services in case of high latency/timeout/loss of network connectivity without loss of data (e.g.: using reliable UDP technology or TPC accelerators to overcome high latency interruptions)

Verification Method: Analysis

Limited bandwidth is defined as bandwidth of less than 12 Mbps.

Requirement ID: IKM-SRS-310

The IKM Tools shall ensure the IKM Tools availability in limited bandwidth context so that users do not experience interruption or degraded IKM Tools Services.

Verification Method: Test

4.2.6 Portability

Portability is the degree of effectiveness and efficiency with which a system, product or component can be transferred from one hardware, software or other operational or usage environment to another.

Requirement ID: IKM-SRS-311

The IKM Tools shall support the ITM provided virtual platform so that it can be transferred to a different HW without major configuration work.

Verification Method: Test

4.2.6.1 Adaptability

Degree to which a product or system can effectively and efficiently be adapted for different or evolving hardware, software or other operational or usage environments.

Requirement ID: IKM-SRS-312

The IKM Tools web capability shall be able to be run at least in the AFPL web browsers and versions: Microsoft Internet Explorer, Mozilla Firefox, Google Chrome and Apple Safari. Especially for the ITM provided web browser.

Verification Method: Test

Requirement ID: IKM-SRS-313

The IKM Tools shall be able to operate in Standalone mode.

Verification Method: Test

Requirement ID: IKM-SRS-314

The IKM Tools shall be able to operate in Data Center mode.

Verification Method: Test

4.2.6.2 Installability

Degree of effectiveness and efficiency with which a product or system can be successfully installed and/or uninstalled in a specified environment.

Requirement ID: IKM-SRS-315

The IKM Tools shall be successfully installed and/or uninstalled in a specified environment effectively and efficiently.

Verification Method: Analysis

Requirement ID: IKM-SRS-315b

The IKM Tools shall be automatically installed via a Graphical User Interface (GUI).

Verification Method: Analysis

Requirement ID: IKM-SRS-316

The IKM Tools shall recognize automatically the environment in which they are deployed (development, test, Iv&V, production), in a way that the same “release package” (i.e. the same solution build) can be used for all the deployment environments, without the need to recompile the application each time

Verification Method: Test

Requirement ID: IKM-SRS-317

The IKM Tools components and/or patches shall be capable of being installed in an automated way, e.g: by a Windows Installer or similar service/product installation package.

Verification Method: Analysis

Requirement ID: IKM-SRS-318

The IKM Tools shall detect, during installation and uninstallation, if the user has sufficient privileges required for the action. The IKM Tools shall report the details of the access failure to the user before aborting the (un)installation.

Verification Method: Test

Requirement ID: IKM-SRS-319

The IKM Tools shall be equipped with an Installation Guide.

Verification Method: Analysis

Requirement ID: IKM-SRS-320

The IKM Tools Installation Guide shall explain all actions to take in order to install and configure the IKM Tools, including COTS components, and underlying needed services and hardware configurations (i.e. Share Point farm). Every action shall be followed by a description (text and/or screenshots) of the feedback which will be displayed.

Verification Method: Analysis

Requirement ID: IKM-SRS-321

The IKM Tools Installation Guide shall describe:

Verification Method: Analysis

- Prerequisites for installing the IKM Tools. (e.g., the necessary OS access right to be able to install the IKM Tools).
- The necessary software, drivers, etc. to install the IKM Tools.
- How to address integration in the 'environment' (node) - like configuration of monitoring and backup functions.
- The (environment specific) configuration changes necessary on the system and the environment.
- The required disc space.

Requirement ID: IKM-SRS-322

The IKM Tools Installation Guide shall describe how to configure the system backbone to be able to run the IKM Tools.

Verification Method: Analysis

Requirement ID: IKM-SRS-323

The IKM Tools Installation Guide shall describe how to configure the DBMS for the IKM Tools. This shall include both the data model and any access/replication mechanism.

Verification Method: Analysis

Requirement ID: IKM-SRS-324

The IKM Tools Installation Guide shall contain a description of all configuration files. The following points shall be described:

Verification Method: Analysis

- The location of the configuration file
- The content of the configuration file
- The available settings of the items in the configuration file and their meaning
- How to change the configuration file

Requirement ID: IKM-SRS-325

The IKM Tools shall provide a GUI automated capability to completely uninstall the IKM Tools application(s)/component(s).

Verification Method: Test

Requirement ID: IKM-SRS-326

The IKM Tools shall allow, as appropriate, "Complete" and "Stand alone" (un)installation options to perform complete (i.e., all components) and Standalone (i.e., reduced-selected components), respectively.

Verification Method: Analysis

4.2.6.3 Internationalisation

Requirement ID: IKM-SRS-327

The IKM Tools shall change effectively and efficiently to deal with additional international conventions in terms of language, time zones and alike localization functionalities.

Verification Method: Analysis

4.2.6.4 Replaceability

Degree to which a product can replace another specified software product for the same purpose in the same environment.

4.2.7 Usability

Degree to which a product or system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. Usability can either be specified or measured as a product quality characteristic in terms of its sub characteristics, or specified or measured directly by measures that are a subset of quality in use.

Requirement ID: IKM-SRS-328

The content and information within the system shall be presented to the user in a consistent, standardized manner.

Verification Method: Test

Requirement ID: IKM-SRS-329

Every input by a user shall consistently produce some perceptible response output from the computer.

Verification Method: Test

Requirement ID: IKM-SRS-330

Only data essential to the user's needs shall be displayed.

Verification Method: Inspection

Requirement ID: IKM-SRS-331

Given a simple Test Suite relative to the major functionalities of the IKM Tools (e.g. a search, the upload of a document, the completion of a workflow task), after an introductory training of no more than 1 hour, the 95% of a population of at least 50 users (randomly selected from the population of the real users that has never been exposed to the new KM Tools developed by the Contractor) will be able to complete the Test Suite in less than 5 minutes

Verification Method: Test

Requirement ID: IKM-SRS-332

The dedicated user roles for the IKM Tools shall adhere to the minimum user rights needed to operate the tools, so that no more than needed rights are assigned to a particular user role (i.e. : End User doesn't need to have System Administration permissions to simply operate the IKM Tools basic functions).

Verification Method: Test

4.2.8 Security

Security is defined as the capability of the software product to protect information and data so that unauthorised persons or systems cannot read or modify them and such that authorised persons or systems are not denied access to them. As well as data stored in or by a product or system, security also applies to data in transmission.

For purposes of this document, the following definitions are used:

Confidentiality: the property that information is not made available or disclosed to unauthorised individuals or entities.

Integrity: the property that information (including data, such as cipher text) has not been altered or destroyed in an unauthorised manner.

Non-repudiation: the measure of assurance to the recipient that shows that information was sent by a particular person or organisation and to the sender that shows that information has been received by the intended recipients.

Accountability: the degree to which actions of an entity can be traced uniquely to the entity.

Authenticity: the degree to which the identity of a subject or resource can be proved to be the one claimed.

The following CIS Security functionalities will be provided by the BI-SC AIS:

- **Confidentiality.** Military-grade NATO IP cryptographic equipment (NICE) will provide confidentiality to User data as well as cryptographic separation between security Domains (for example, NATO SECRET, NATO UNCLASSIFIED, MISSION SECRET). Information exchange between these security domains will be achieved through appropriate boundary protection services (BPS). As a minimum, NICE will be located at each boundary between the local area networks (LANs) and the NATO wide area network (WAN). This will ensure that all User data will be encrypted prior to transmission across the NATO WAN. Software application layer mechanisms will be used for Community-of-Interest (COI) separation.
- **Integrity.** Digital signatures and authentication services will be used by various protocols (e.g., SNMP, IPSEC) to provide integrity and strong authentication to User data and network configurations. The NATO Public Key Infrastructure (NPKI) will enable these specific security services.

Infrastructure security as provided by the Bi-SC AIS Infrastructure will be transparent to the IKM Tools.

Requirement ID: IKM-SRS-333

The IKM Tools shall be compliant with NATO document [C-M(2002)49] for the protection of NATO classified information, supporting systems services and resources in CIS, or other storing devices, processing and transmitting systems.

Verification Method: Analysis

Requirement ID: IKM-SRS-334

The IKM Tools components shall be configured with the latest security patches and updated with the latest security guidelines from the NATO Information Assurance Technical Centre (NIATC). This shall be enforced on all environments (e.g. operational environment, training environment, reference systems environment), while applying the appropriate CM process and procedures.

Verification Method: Analysis

Requirement ID: IKM-SRS-335

The IKM Tools shall be capable of operating within the NS and MS WAN environment (including servers, network, services and workstations) in the presence of the currently approved NATO Security Settings (target version to be provided by the Purchaser during the Design Stage). Any deviations from the approved security settings shall be identified by the Contractor prior to testing and shall be subject to approval of the Purchaser.

Verification Method: Test

Requirement ID: IKM-SRS-336

The IKM Tools shall adhere to the "CIS Security Technical and Implementation Directive for the Security of Web Applications" (NHQC3S(C3CAM)0014-2019 (INV), 26 Sept. 2019) for securing the web services and applications.

Verification Method: Analysis

4.2.8.1 Confidentiality

Requirement ID: IKM-SRS-337

The IKM Tools shall ensure that a confidentiality label (policy, classification, releasability) is automatically included into each the IKM Tools information <element or product>, showing the highest classification of information it contains.

Verification Method: Analysis

Requirement ID: IKM-SRS-338

In line with C-M(2002)49-COR12 , the Security Classification in the IKM Tools shall include:

Verification Method: Analysis

- Policy Identifier/ Information Ownership: e.g. NATO, NATO/EAPC (Euro-Atlantic Partnership Council), ISAF (International Security Assistance Force)
- Classification Marking: e.g. Unclassified, Restricted, Confidential, Secret
- Category/Caveats: e.g. Releasable to AUS/FIN, Releasable to RS, Releasable to Coalition

Requirement ID: IKM-SRS-339

The machine readable structure of the Security Label in the IKM Tools shall be in accordance with INFOSEC Technical & Implementation Guidance for Electronic Labelling of NATO Information [AC/322-D (2004)0021].

Verification Method: Analysis

Requirement ID: IKM-SRS-340

The IKM Tools shall provide visual confirmation to Users (on-screen) of the security classification including any releasability caveats (e.g., Releasable to RS) of the displayed data.

Verification Method: Inspection

Requirement ID: IKM-SRS-341

The IKM Tools shall include a configurable colour-based visual cue in addition to text to indicate security classification in screens, reports and prints.

Verification Method: Test

Requirement ID: IKM-SRS-342

The IKM Tools shall insert a Security Classification construct into headers/footers and metadata of generated, created or exported reports, MS Office files and PDF files. The user shall be prompted to be able to change the security classification.

Verification Method: Inspection

Requirement ID: IKM-SRS-343

The IKM Tools shall propose the highest classification level of the selected objects. If no classification is specified for the selected objects, then the repository classification level shall be proposed.

Verification Method: Test

Requirement ID: IKM-SRS-344

The IKM Tools shall allow the authorised user to override the proposed classification level by choosing another. Classification is mandatory and shall be composed of three fields: authority, classification, and releasability.

Verification Method: Test

4.2.8.2 Integrity

Requirement ID: IKM-SRS-345

The IKM Tools shall maintain referential integrity between entities across all services avoiding orphan entities (e.g.: deletion of a workflow results in deletion of all related entities: sub activities, sub-workspaces, documents and alike).

Verification Method: Analysis

Requirement ID: IKM-SRS-346

The IKM Tools shall implement a two-phase deletion process (i.e., a logical/soft delete with User-controlled permanent deletion/purging) for entities.

Verification Method: Analysis

4.2.8.3 Authenticity

4.2.8.3.1 General

Definitions:

User: refers to a person having access to the operating system (an OS User) and IKM Tools Services. Each User of the IKM Tools is assigned Access Rights based on its Role, the Permissions within that Role, and optionally the Organization of the User.

Role: Defined by a set of permissions (i.e., access to objects and functionality) to perform certain operations.

Basic Role: One of [NUMBER] primary roles in IKM Tools (i.e., User, Organisational Node Administrator, Enterprise Administrator, System Administrator).

The primary Basic Roles in the IKM Tools are:

- **The IKM Tools User:** a person having Access Rights for the IKM Tools User Functionality. This functionality includes viewing, creating, collaborating and maintaining [INFORMATION_OBJECTS].
- **The IKM Tools Organizational Node Administrator:** a person having Access Rights for the IKM Tools Organizational Node Administrator Functionality. This functionality includes managing the IKM Tools Accounts, Access Rights, defining the Application or Information Portal Structure, and defining Information Exchange Contracts.
- **The IKM Tools Enterprise Administrator:** a person having Access Rights for the IKM Tools Enterprise Administrator Functionality. This functionality includes maintaining the enterprise-wide configuration (e.g., domain values).
- **The IKM Tools System Administrator:** a person having Access Rights for the IKM Tools System Administrator Functionality. This functionality includes the functionality for the IKM Tools System Administration and the IKM Tools System Maintenance. The IKM Tools System Administration Functionality includes deploying, configuring and updating the IKM Tools.

List of basic roles:

Organizational Node Administrators are generally members of the staff responsible for User management, domain value management and system configuration for that particular the IKM Tools organizational node.

Organizational Node Administrators are also responsible for adapting and localising production workflow sequences to guide and control processes.

Organizational Node Administrators are able to assign User permissions on types of information objects (e.g., Overlay) and functions (e.g., Read, Create, Modify, Delete) on those objects for that particular organizational node. To simplify administration, a role may be specified from more basic roles and permission sets.

Organizational Node Administrators will have the capability to perform content management functions, including data cleansing and archiving.

Enterprise Administrators are responsible for overall management and administration of the system, including both technical and procedural aspects. In general, Enterprise Administrators are identified for each mission/domain.

Procedural and administrative responsibilities of the Enterprise Administrators include the creation, documentation and enforcement of operating policies and procedures associated with functional system configuration; domain management; User access and privilege management; data stewardship; workflow management; and identification and resolution of functional issues.

Enterprise Administrators are responsible for overseeing development and maintenance of Standard Operating Procedures (SOPs) and coordination with Organizational Node Administrators.

The technical responsibilities of Enterprise Administrators include enterprise domain management; collection of performance and accounting data; and ensuring security mechanisms are working.

Enterprise Administrators are also responsible for identifying standard production workflow sequences.

System Administrators are generally NCI Agency or other local CIS support personnel responsible for system and network technical issues, and for ensuring the proper configuration, network connectivity and recoverability of the system. Responsibilities of the System Administrators include network and domain management; back-up and recovery of file systems and databases; and administration of the IKM Tools applications and servers. System administrators are responsible for maintaining Windows User groups and adding new Users to the Windows domain, and (re)installing the system as required.

Requirement ID: IKM-SRS-347

The IKM Tools shall support access (if authorised) to all system functionalities up to the maximum number of Users identified for that site category (e.g., there shall be no licensing restrictions on the number of Users who can simultaneously access a particular functionality).

Verification Method: Analysis

4.2.8.3.2 Authentication Processing

Requirement ID: IKM-SRS-348

The IKM Tools shall uniquely Identify and Authenticate Users.

Verification Method: Analysis

Requirement ID: IKM-SRS-349

The IKM Tools shall allow an authorised user (i.e. The IKM Tools Admin) to manage (create, update, delete) the IKM Tools User Accounts, password details, and assign User Roles to User Account and manage general access privileges of individual User Accounts.

Verification Method: Analysis

Requirement ID: IKM-SRS-350

The IKM Tools shall apply password policy [AC/322-D/0048-REV3]. .

Verification Method: Analysis

The password policy will enforce individuals to select a password that is at least 9 characters long, comprising uppercase, lowercase and symbols. The password must be changed every 6 months or if the user suspects it has been compromised (for example, if the user thinks anyone has observed entering the password).

Requirement ID: IKM-SRS-351

The IKM Tools shall deny the re-use of [NUMBER] previous passwords.

Verification Method: Analysis

Requirement ID: IKM-SRS-352

The IKM Tools user accounts shall be locked after defined unsuccessful authentication attempts.

Verification Method: Analysis

Requirement ID: IKM-SRS-353

The IKM Tools passwords shall be stored in encrypted form.

Verification Method: Analysis

Requirement ID: IKM-SRS-354

The IKM Tools shall protect User credentials in transit.

Verification Method: Analysis

Requirement ID: IKM-SRS-355

The IKM Tools shall protect session IDs.

Verification Method: Analysis

Requirement ID: IKM-SRS-356

The IKM Tools session IDs shall never be included in any URL or sent in the referrer header to prevent caching by the browser. Session IDs shall be long, complicated random numbers which cannot be easily guessed.

Verification Method: Analysis

Requirement ID: IKM-SRS-357

The IKM Tools shall employ encryption of the entire login transaction using SSL or similar technologies. This requirements shall only be applicable for the option when no domain authentication is used.

Verification Method: Analysis

Requirement ID: IKM-SRS-358

The IKM Tools shall allow the system administrator to set a "timeout" period which shall automatically log-out any sessions which have been inactive for that period of time. The system administrator shall be able to disable this feature.

Verification Method: Analysis

Requirement ID: IKM-SRS-359

The IKM Tools shall allow the system administrator to prevent multiple concurrent authentications from the same user from different locations (IP addresses). The system administrator shall be able to disable this feature.

Verification Method: Analysis

Requirement ID: IKM-SRS-360

The IKM Tools shall protect the User's entire session via SSL to ensure that the session ID (e.g., session cookie) cannot be read off the network.

Verification Method: Analysis

Requirement ID: IKM-SRS-361

The IKM Tools shall allow the User (with the same User-id) to access the same information and functionality from any workstation on the NS WAN (i.e., 'roving User' functionality). This capability shall not depend on the availability of Active Directory.

Verification Method: Analysis

Requirement ID: IKM-SRS-362

Role-based access control shall be applied according to the following guidelines:

Verification Method: Analysis

- Users are associated with User Roles and also with Organizations.
- User Roles determine the functions and types of objects available to the User.
- Organizations determine the data available for use by the available functions.
- A User has permission on a particular data item only if the User has an authorised Role and is a member of that Organization.

Requirement ID: IKM-SRS-363

If an authorised the IKM Tools User is a member of more than one Organization (i.e., Organizational Node), the User shall be prompted to select the Organization to be used during that session.

Verification Method: Analysis

Requirement ID: IKM-SRS-364

The IKM Tools shall allow authenticated Users to manage their password and their User profile (e.g., e-mail address, unit) information.

Verification Method: Analysis

Requirement ID: IKM-SRS-365

The IKM Tools shall provide help texts to support the login process together with links to recover lost password and login details.

Verification Method: Analysis

Requirement ID: IKM-SRS-366

The IKM Tools shall limit the feedback of information during authentication to prevent Users gaining knowledge of the authentication process.

Verification Method: Analysis

4.2.8.4 Audit and Accountability

Requirement ID: IKM-SRS-367

The IKM Tools shall generate audit records for auditable events, addressing at a minimum the following events:

Verification Method: Test

- system start-up (including re-starts) and shutdown
- log-on (including log-on attempts) and log-off of individual users
- changes to permissions and privileges of users and groups
- changes to security relevant system management information(including audit functions)
- start-up and shutdown of the audit function
- any access to security data
- deletion, creation or alteration of the security audit records;#
- changes to system date and time
- unsuccessful attempts to access system resources

Requirement ID: IKM-SRS-368

The IKM Tools shall establish access permissions to audit information.

Verification Method: Test

Requirement ID: IKM-SRS-369

The IKM Tools shall associate individual user identities to auditable events.

Verification Method: Test

Requirement ID: IKM-SRS-370

The IKM Tools shall action on failed attempts at log-on.

Verification Method: Test

Requirement ID: IKM-SRS-371

The IKM Tools shall create and maintain an archive of audit information.

Verification Method: Test

Requirement ID: IKM-SRS-372

The IKM Tools shall retain audit information for a configurable period of time by IKM Administrator.

Verification Method: Test

Requirement ID: IKM-SRS-373

The IKM Tools shall ensure log files are manageable so that the size doesn't affect the performance or functionality. (i.e. limiting the size to 10 Mb).

Verification Method: Analysis

4.2.8.4.1 User Audit Log

Requirement ID: IKM-SRS-374

The IKM Tools shall record in traceable logs all selected transactions, database activities, technical events (e.g., dataset synchronisation, directory replication) and accessing of data.

Verification Method: Test

Requirement ID: IKM-SRS-375

If so configured, the IKM Tools shall ensure operations at the business object level are recorded in traceable logs.

Verification Method: Test

Requirement ID: IKM-SRS-376

If so configured, the IKM Tools shall ensure User operations at system function level are recorded in traceable logs.

Verification Method: Test

Requirement ID: IKM-SRS-377

If so configured, the IKM Tools shall support audit trailing to all User and the IKM Tools system actions and messages on sending, deleting and viewing to log all User activities.

Verification Method: Test

Requirement ID: IKM-SRS-378

If so configured, the IKM Tools shall log all configurations changes with the trace to persons or systems.

Verification Method: Test

4.2.8.4.2 System Audit Log

Requirement ID: IKM-SRS-379

The IKM Tools shall generate and maintain an Audit Log for each of the following auditable events, shall associate individual User identities to those events, and shall include date and time of the event, type of event, User identity, and the outcome (success or failure) of the event:

Verification Method: Test

- System start-up and shutdown
- the start/end time of usage of system applications (system components) by individual Users
- Changes to permissions and privileges of Users and groups
- Changes to security relevant system management function
- Configuration changes
- Any access to audit log
- Deletion, creation or alteration of the security audit records
- All privileged operations
- All updates of the IKM Tools access rights
- All attempts to delete, write or append the Audit files

4.2.8.5 Web Security

4.2.8.5.1 Authentication

Requirement ID: IKM-SRS-380

Authentication shall be through an authorized identity provider. Where appropriate, other authentication requirements shall be enforced by the authorized identity provider.

Verification Method: Analysis

Requirement ID: IKM-SRS-381

Identity Information related to authentication (such as credentials) managed by the website shall not traverse public networks unencrypted.

Verification Method: Analysis

Requirement ID: IKM-SRS-382

Forgot password functionality and other recovery paths shall do not send the existing or new passwords in clear text to the user.

Verification Method: Analysis

Requirement ID: IKM-SRS-383

No default passwords shall be used, for the website or any components.

Verification Method: Analysis

Requirement ID: IKM-SRS-384

Passwords shall never be hard-coded in any source code. Not even in an encrypted/hashed form.

Verification Method: Analysis

Requirement ID: IKM-SRS-385

All authentication controls shall be enforced on the server side.

Verification Method: Analysis

Requirement ID: IKM-SRS-386

Account passwords shall be stored encrypted or hashed in such a way it should not be possible to identify identical passwords.

Verification Method: Analysis

Requirement ID: IKM-SRS-387

Users shall be able to safely change their credentials using a mechanism that is at least as resistant to attack as the primary authentication mechanism.

Verification Method: Analysis

Requirement ID: IKM-SRS-388

Authentication credentials shall be configured to expire after an administratively configurable period.

Verification Method: Test

Requirement ID: IKM-SRS-389

All authentication decisions shall be logged, including increased delays between successive unsuccessful logging attempts (linear back-offs) and temporal account locks (soft-locks).

Verification Method: Test

Requirement ID: IKM-SRS-390

Forgotten password and other recovery paths shall send a time-limited activation token or use two factor proofs

Verification Method: Test

Requirement ID: IKM-SRS-391

The IKM Tools implementation shall be compatible with FMN Spiral 4 Service Instructions for Web Authentication.

Verification Method: Analysis

4.2.8.5.2 Session Management

Requirement ID: IKM-SRS-392

A session management mechanism shall be used after a successful authentication, and the related security context shall be maintained until the session expires. Any change in the security context shall require re-authentication.

Verification Method: Test

Requirement ID: IKM-SRS-393

Sessions shall be invalidated when the user logs out.

Verification Method: Test

Requirement ID: IKM-SRS-394

Sessions shall timeout after a specified period of inactivity.

Verification Method: Test

Requirement ID: IKM-SRS-395

Only non-persistent cookies shall be used for session management purposes, so that the session ID does not remain on the web client cache for long periods of time.

Verification Method: Test

Requirement ID: IKM-SRS-396

Session ID shall be changed or cleared on logout or when the session expires.

Verification Method: Test

Requirement ID: IKM-SRS-397

At least one mechanism shall be used to prevent cookie theft and session hijacking (e.g. HttpOnly and Secure attributes or usage of TLS during the entire session)

Verification Method: Inspection

Requirement ID: IKM-SRS-398

The Session ID shall be changed on re-authentication.

Verification Method: Test

Requirement ID: IKM-SRS-399

Session IDs shall never be cached, applications must use restrictive cache directives for all the web traffic exchanged through HTTP and HTTPS, such as the "Cache-Control: no-cache, no-store" and "Pragma: no-cache" HTTP headers, and/or equivalent META tags on all or (at least) sensitive web pages.

Verification Method: Test

Requirement ID: IKM-SRS-400

It shall not be possible to determine a session ID knowing the previously generated ID(s). For that reason, session IDs shall be generated using a cryptographically secure (pseudo)random number generator and they shall be at least 128 bits long.

Verification Method: Test

Requirement ID: IKM-SRS-401

Only Session IDs generated by the application framework shall be recognized as valid by the application, unless for a business requirement such as single sign on.

Verification Method: Test

Requirement ID: IKM-SRS-402

Session IDs using cookies shall have their path set to an appropriately restrictive value for that site. The domain cookie attribute restriction should not be set unless for a business requirement, such as single sign on.

Verification Method: Test

Requirement ID: IKM-SRS-403

The application shall not permit duplicate concurrent user sessions, originating from different machines.

Verification Method: Test

4.2.8.5.3 Access Control

Requirement ID: IKM-SRS-404

Access controls shall be enforced on the server side.

Verification Method: Analysis

Requirement ID: IKM-SRS-405

User and data attributes and policy information used by access controls shall not be manipulated by end users unless specifically authorized.

Verification Method: Analysis

4.2.8.5.4 Input validation

Requirement ID: IKM-SRS-406

The runtime environment shall not susceptible to buffer overflows, or there shall be security controls preventing buffer overflows.

Verification Method: Test

Requirement ID: IKM-SRS-407

The runtime environment shall not susceptible to SQL Injection, or there shall be security controls preventing SQL Injection.

Verification Method: Test

Requirement ID: IKM-SRS-408

The runtime environment shall not susceptible to Cross Site Scripting (XSS), or there shall be security controls preventing XSS Injection.

Verification Method: Test

Requirement ID: IKM-SRS-409

The runtime environment shall not susceptible to LDAP Injection, or there shall be security controls preventing LDAP Injection.

Verification Method: Test

Requirement ID: IKM-SRS-410

The runtime environment shall not susceptible to OS Command Injection, or there shall be security controls preventing OS Command Injection.

Verification Method: Test

Requirement ID: IKM-SRS-411

The runtime environment or parser shall not be susceptible to XML and XPath injection or there shall be security controls preventing XML and XPath injection.

Verification Method: Test

Requirement ID: IKM-SRS-412

All input validation failures shall result in input rejection or input sanitization in accordance with the NCIRC guidance.

Verification Method: Analysis

Requirement ID: IKM-SRS-413

Input validation or encoding routines shall be performed and enforced on the server side in accordance with the NCIRC guidance.

Verification Method: Analysis

Requirement ID: IKM-SRS-414

If input validation controls are enforced by the presentation layer on the client side (e.g. size or format constraints, input type, etc.) the same controls shall be enforced on the server side.

Verification Method: Analysis

Requirement ID: IKM-SRS-415

Parameters shall be canonicalized, input validated, and output encoded to prevent both local and remote file inclusion attacks, particularly where input could be executed, such as header, source, or template inclusion. Parameters shall never be used to manipulate filenames, pathnames or any file system object without first being canonicalized and input validated to prevent local file inclusion attacks.

Verification Method: Analysis

4.2.8.5.5 Cryptography at rest

Requirement ID: IKM-SRS-416

All cryptographic functions shall be implemented on the server side unless purposely designed in another manner.

Verification Method: Analysis

Requirement ID: IKM-SRS-417

Data-at-rest decryption keys shall be protected from unauthorized access.

Verification Method: Analysis

Requirement ID: IKM-SRS-418

Cryptographic keys shall be managed (e.g., generated, distributed, revoked, expired) using approved NATO policies [AC/322-D/0047, 2009].

Verification Method: Analysis

Requirement ID: IKM-SRS-419

Cryptographic algorithms used by the application shall be selected from the NATO Type B algorithm suite.

Verification Method: Analysis

4.2.8.5.6 Error handling and Logging

Requirement ID: IKM-SRS-420

The application shall not output error messages or stack traces containing sensitive data that could assist an attacker, including Session ID and personal information.

Verification Method: Test

Requirement ID: IKM-SRS-421

Logs events shall include at a minimum:

Verification Method: Test

- Time stamp from a reliable source
- Severity level of the event
- An indication that this is a security relevant event (if mixed with other logs)
- The identity of the user that caused the event (if there is a user associated with the event)
- The source IP address of the request associated with the event
- Status of the event (e.g. succeeded or failed)
- A description of the event

Requirement ID: IKM-SRS-422

Logging controls shall be implemented on the server.

Verification Method: Analysis

Requirement ID: IKM-SRS-423

Security logging controls shall have the ability to log both success and failure events that are identified as security-relevant.

Verification Method: Test

Requirement ID: IKM-SRS-424

Security logs shall be protected from unauthorized access and modification.

Verification Method: Analysis

Requirement ID: IKM-SRS-425

A log analysis tool shall be available to allow the analyst to search for log events based on combinations of search criteria across all fields in the log record format supported by this system.

Verification Method: Test

4.2.8.5.7 Data Protection

Requirement ID: IKM-SRS-426

Forms containing sensitive information shall have disabled client side caching, including autocomplete features.

Verification Method: Test

Requirement ID: IKM-SRS-427

Sensitive data shall be sent to the server in the HTTP message body (i.e., URL parameters are never used to send sensitive data).

Verification Method: Test

Requirement ID: IKM-SRS-428

Cached or temporary copies of sensitive data sent to the client or stored in the server shall be protected from unauthorized access or purged/invalidated after the authorized user accesses the sensitive data (e.g., the proper no-cache and no-store Cache-Control headers are set).

Verification Method: Test

Requirement ID: IKM-SRS-429

The list of sensitive data processed by the site shall be identified, and that there shall be an explicit policy for how access to this data must be controlled, and when this data must be encrypted (both at rest and in transit).

Verification Method: Test

Requirement ID: IKM-SRS-430

There shall be a method to remove each type of sensitive data from the application at the end of its required retention period.

Verification Method: Test

Requirement ID: IKM-SRS-431

The integrity of interpreted code, libraries, executables, and configuration files shall be verified using checksums or hashes.

Verification Method: Test

Requirement ID: IKM-SRS-432

Sensitive data shall be rapidly sanitized from memory as soon as it is no longer needed.

Verification Method: Test

Requirement ID: IKM-SRS-433

The application should have the ability to detect and alert on abnormal numbers of requests to prevent screen scraping, automated use of web service extraction or data loss prevention.

Verification Method: Test

4.2.8.5.8 Communications Security

Requirement ID: IKM-SRS-434

IKM Tools certificates shall have a path built from a trusted CA to each Transport Layer Security (TLS) server certificate, and each server certificate shall match the Fully Qualified Domain Name of the server and be valid.

Verification Method: Inspection

Requirement ID: IKM-SRS-435

TLS shall be used for all connections, internal (e.g. backend) or external, that involve sensitive data or functions.

Verification Method: Test

Requirement ID: IKM-SRS-436

Backend TLS connection failures shall be logged.

Verification Method: Test

Requirement ID: IKM-SRS-437

Connections to external systems that involve sensitive information or functions shall be authenticated.

Verification Method: Test

Requirement ID: IKM-SRS-438

Connections to/from external systems shall use accounts configured to have the minimum privileges necessary for the application to function properly.

Verification Method: Test

Requirement ID: IKM-SRS-439

Failed TLS connections shall not fall back to an insecure connection.

Verification Method: Test

Requirement ID: IKM-SRS-440

Certificate paths shall be built for all client certificates using configured trust anchors and revocation information.

Verification Method: Test

Requirement ID: IKM-SRS-441

The application shall use a single standard TLS implementation that is configured to operate in an approved mode of operation

Verification Method: Test

Requirement ID: IKM-SRS-442

Specific character encodings shall be defined for all connections (e.g., UTF-8).

Verification Method: Test

4.2.8.5.9 HTTP Security

Requirement ID: IKM-SRS-443

The application shall accept only a defined set of HTTP request methods, such as GET and POST, unused methods shall be explicitly blocked.

Verification Method: Test

Requirement ID: IKM-SRS-444

Every HTTP response shall contain a single content type header specifying a safe character set (e.g., UTF-8).

Verification Method: Test

Requirement ID: IKM-SRS-445

HTTP headers, in both requests and responses, and URIs shall contain only printable ASCII characters.

Verification Method: Test

Requirement ID: IKM-SRS-446

Web sites shall never switch a given session from HTTP to HTTPS, or vice versa, as this can disclose the session ID in the clear through the network.

Verification Method: Test

Requirement ID: IKM-SRS-447

If HTTPS is required, the web application shall make use of "HTTP Strict Transport Security (HSTS)" (previously called STS) to enforce HTTPS connections.

Verification Method: Test

Requirement ID: IKM-SRS-448

When feasible, web applications should not mix encrypted and unencrypted contents (HTML pages, images, CSS, JavaScript files, etc.) on the same host (or even domain - see the "domain" cookie attribute), as the request of any web object over an unencrypted channel might disclose the session ID.

Verification Method: Test

Requirement ID: IKM-SRS-449

When feasible, web applications, should not offer public unencrypted contents and private encrypted contents from the same host. It is recommended to instead use two different hosts, such as www.example.com over HTTP (unencrypted) for the public contents, and secure.example.com over HTTPS (encrypted) for the private and sensitive contents. The former host only has port TCP/80 open, while the later only has port TCP/443 open

Verification Method: Test

4.2.8.5.10 Files and resources

Requirement ID: IKM-SRS-450

Files, other than static pages and dynamic content (CGI scripts), shall be stored outside the Webroot.

Verification Method: Analysis

Requirement ID: IKM-SRS-451

The web or application server shall be configured by default to deny access to remote resources or systems outside the web or application server.

Verification Method: Analysis

Requirement ID: IKM-SRS-452

The application code shall not execute uploaded data.

Verification Method: Analysis

Requirement ID: IKM-SRS-453

Rich internet applications cross domain resource sharing configuration shall be configured to prevent unauthenticated or unauthorized remote access.

Verification Method: Analysis

Requirement ID: IKM-SRS-454

Remote IFRAMEs and HTML 5 cross-domain resource sharing shall not allow inclusion of arbitrary remote content.

Verification Method: Analysis

4.2.8.5.11 Miscellaneous (HTML5/JavaScript/ActiveX)

Requirement ID: IKM-SRS-455

Sensitive data shall not be stored in storage area of a thick client, including to system or application logs.

Verification Method: Analysis

Requirement ID: IKM-SRS-456

3rd-party JavaScript libraries or thick-client shall be hosted within the web application/web server and not hot-linked from external untrusted sources

Verification Method: Analysis

Requirement ID: IKM-SRS-457

Thick clients shall not request more permissions or access to resources than those strictly required for its correct operation

Verification Method: Analysis

Requirement ID: IKM-SRS-458

3rd-party JavaScript libraries in use shall be up to date and contain no known vulnerabilities.

Verification Method: Analysis

Requirement ID: IKM-SRS-459

Thick-client code shall be signed.

Verification Method: Test

Requirement ID: IKM-SRS-460

Thick-client shall be configured to run in a restricted sandbox, with no access to OS resources, such as file system or native libraries.

Verification Method: Test

Requirement ID: IKM-SRS-461

The thick-client binary shall be obfuscated.

Verification Method: Test

Requirement ID: IKM-SRS-462

The thick client shall implement certificate pinning to prevent the proxying of app traffic.

Verification Method: Test

Requirement ID: IKM-SRS-463

The query string shall not be used for sensitive data. Instead, a POST request via SSL should be used with a CSRF token.

Verification Method: Test

4.3 Compatibility-Interoperability

4.3.1 Interface Requirements

Interoperability is defined in ISO 25010 as the degree to which two or more systems, products or components can exchange information and use the information that has been exchanged.

Within NATO, interoperability is defined as, the ability to act together coherently, effectively and efficiently to achieve Allied tactical, operational and strategic objectives.

Requirement ID: IKM-SRS-464

The IKM Tools software code and components shall comply with the latest version of the NATO Interoperability Standards and Profiles (NISP). Any deviation is to be justified and reviewed by the Technical Project Board.

Verification Method: Analysis

Requirement ID: IKM-SRS-465

If new interoperability profiles are to be developed (e.g.: new templates) they shall be compliant and included into the NISP volumes. The interfaces will use the IKM Tools Data Model and be compliant to NATO Core Metadata Specification.

Verification Method: Analysis

4.3.1.1 Interface Control Document

Requirement ID: IKM-SRS-466

For each specified interface (i.e., inputs and outputs to the IKM Tools and between the IKM Tools and another systems), the IKM Tools shall be equipped with an Interface Control Document (ICD) describing the interface. The ICD shall be in a format proposed by the Contractor and accepted by the Purchaser. The content shall include, where applicable, the following information:

Verification Method: Analysis

- A list of the applicable technical standards
- A catalogue of the services and interfaces exposed by the IKM Tools
- A detailed description of the interfaces, including diagrams, data elements, data formats, performance values, communication protocols, security settings, etc.
- Descriptions of data elements
- units of measure required for the data element, such as seconds, meters, kilohertz, etc.
- limit/range of values required for the data element (for constants provide the actual value)
- precision or resolution required for the data element in terms of significant digits,

- frequency at which the data element is calculated or refreshed, such as 10 KHz or 50 msec
- legality checks performed on the data element
- data type, such as integer, ASCII, fixed, real, enumerated, etc.
- data representation/format
- priority of the data element
- Service Descriptors, identifying the services endpoints, a detailed description of the service operations and service parameters
- All related artefacts such as WSDL, schema files and descriptors
- Message descriptions
- Interface priority
- Communications protocol

4.3.1.2 Interface Mechanisms

Requirement ID: IKM-SRS-467

The following information exchange mechanisms can be used in the IKM Tools:

Verification Method: Analysis

- Web services
- File exchange
- Direct database and file access (justification needed)
- API (justification needed)

4.3.1.2.1 Web Services

Web services provide a standard means of interoperability between different software applications, running on a variety of platforms and/or frameworks.

The architecture style defining a SOA (Service Oriented Architecture) describes a set of patterns and guidelines for creating loosely coupled systems that enable a clear separation between the service provider and service consumer. The service provider is the one, who publishes a service description and provides the implementation of the service; whereas the service consumer is the one who invokes the service without knowing any implementation details about the service. This approach not only enables a loosely coupling integration between systems but also simplifies the integration by hiding the unnecessary implementation details.

Web Services are intended to provide self-describing, self-contained, modular units of software application logic that provide defined business functionality. Web Services are consumable software services that typically include some combination of business logic and data. Web Services can be aggregated to establish a larger workflow or business transactions. Inherently, the architectural components of web services support messaging, services description, registries and loosely coupled interoperability.

Requirement ID: IKM-SRS-468

[See Bi-SC Core Enterprise Services Requirements for IKM Tools requirements and Bi SC AIS Platform -Interface Requirements module for a complete set of Web Services requirements via the traceability link].

Verification Method: Analysis

4.3.1.2.2 File Exchange

Requirement ID: IKM-SRS-469

File exchange will require in some instances, to enable the exchange of information between systems for reasons of legacy, security, connectivity, capability or efficiency. Bespoke file formats, where possible, shall use XML as the primary mechanism for file-level information exchange.

Verification Method: Analysis

Requirement ID: IKM-SRS-470

The IKM Tools shall provide adequate documentation for the content and meaning of the file formats it produces or accepts. An adequate definition is one that enables a programmer or user to understand the meaning of the data and determine whether it is suitable for its intended use. The IKM Tools shall supply a definition for every element, attribute, and enumeration value defined in the file format.

Verification Method: Analysis

4.3.1.2.3 Direct Database and File Access

In limited instances, direct database access in the IKM Tools may be required to enable information exchange or visualisation.

Requirement ID: IKM-SRS-471

As a design rule, direct database access in the IKM Tools should be avoided.

Verification Method: Analysis

4.3.1.2.4 Application Programming Interfaces (APIs)

Requirement ID: IKM-SRS-472

The IKM Tools may need to use Application Programming Interface (API) in some special cases only when the use of Web Services is not possible (needs justification). An adequate definition for an API is one that enables a software architect or developer to understand the meaning of the interface and determine whether it is suitable for its intended use. For each API component, the IKM Tools will fully document the interface, including:

Verification Method: Analysis

- Mechanisms for securely invoking the API
- Available methods and functionality
- Available information elements, including attributes and enumeration values
- Error handling.

4.3.1.3 Interface Security

Requirement ID: IKM-SRS-473

The IKM Tools shall use Generic Security Services Application Program Interface (GSS API), as possible, as the application programming interface for accessing security services.

Verification Method: Analysis

Requirement ID: IKM-SRS-474

The IKM Tools primary security services (access control, confidentiality, integrity, authentication, and non-repudiation) shall be supported by X.509.

Verification Method: Analysis

Requirement ID: IKM-SRS-475

The IKM Tools X.509 support to primary security services shall be compliant with NPKI.

Verification Method: Analysis

4.3.2 External Interface Requirements

The IKM Tools has interfaces with NATO external systems and services in order to be able to exchange information. These interfaces can be placed in different networks and domains (NS, NR, NU and Mission Secret).

4.3.2.1 NATO Bi-SC AIS Core Services

Core Information Services provide the common foundation and standard interfaces to support inter-domain *Interoperability* within NATO and with NATO partner nations. They reflect the minimum requirement to support the command and control of all military functions.

4.3.2.1.1 Unified Communication and Collaboration Services (UCC)

UCC is intended to provide interaction and collaboration services (e.g. text chat, voice over IP, VTC over IP) to support the command and control of all military functions.

Requirement ID: IKM-SRS-476

The IKM Tools shall be integrated with the Bi-SC AIS Unified Communication and Collaboration Services.

Verification Method: Analysis

Requirement ID: IKM-SRS-477

The IKM Tools shall be compatible with Bi-SC AIS collaborative services and protocols (e.g., SIP).

Verification Method: Analysis

4.3.2.1.1 Instant Messaging

Instant messaging supports instantaneous synchronous communication and includes the capability to discover people/contacts including their real-time presence information, ad hoc collaboration and participation in a number of concurrent sessions.

Requirement ID: IKM-SRS-478

The IKM Tools shall support interoperability with instant messaging based on the Extensible Messaging and Presence Protocol (XMPP).

Verification Method: Analysis

Requirement ID: IKM-SRS-479

The IKM Tools shall conform to the fundamental features and security mechanisms of instant messaging as described in the Service Interface Profile for Basic Collaboration Services (AI 06.02.12).

Verification Method: Analysis

4.3.2.1.2 Information Exchange Services

The IKM Tools services will perform in multiple security domains (NATO UNCLASSIFIED, NATO SECRET) where rules, regulations and category of personnel are different.

When the IKM Tools servers will exchange and synchronise information between (i.e. across) the NS and MS domains, multiple procedures and devices will be available in support of these exchanges. The IKM Tools will provide the appropriate means to support these cross-domain exchanges.

Cross-domain support service is necessary when the IKM Tools is used in a distributed environment for creating and feeding the Information Products from various sources spread across different Security Domains

The NATO IEG supports different scenarios in order to meet operational needs for Cross-domain information exchange as described in AC/322-D0030-Rev5.

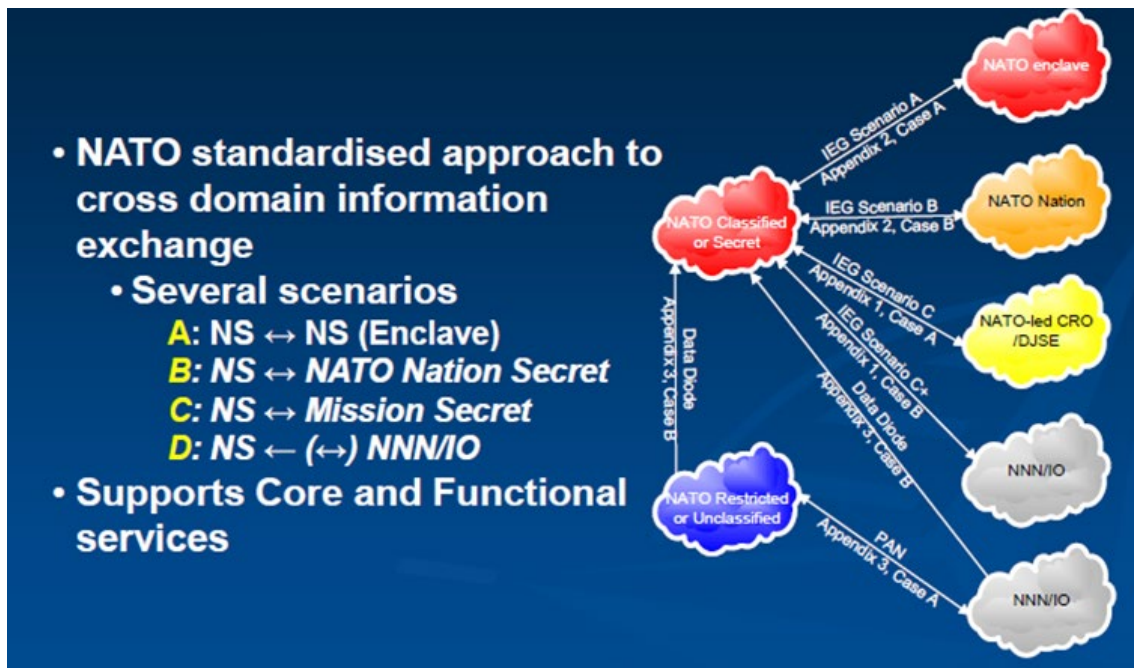


Figure 22 IEG Scenarios

IEG-C operates as two chained HTTP proxies, one for High to Low information exchanges and another one for Low to High information exchanges. Between the proxies there is a filtering engine that sanitizes the information flows in each direction, checking both the header and the body of the HTTP transport messages. The IEG-C targets the content of the HTTP body, which must be an XML document.

IEG-C can filter both SOAP and REST Web Services, or any custom XML protocol that uses HTTP as transport. The IEG-C expects a specific structure for the labelling of the data objects, and the signatures to bind the security labels metadata to the data objects.

The current IEG solution cannot handle HTTPS endpoints.

Requirement ID: IKM-SRS-480

The IKM Tools shall create as required (if not existing from the source), include and maintain the appropriate Security Classification (including Policy (e.g. NATO, NATO/EAPC), Classification (e.g. SECRET) and Category (e.g. Releaseable to ISAF)) for each piece of information across the IKM Tools Services through the use of NATO XML labelling standards.

Verification Method: Analysis

Requirement ID: IKM-SRS-481

The IKM Tools shall assign Confidentiality Labels as defined in [ADatP-4774] and [ADatP-4778] to all information products, information objects, messages, files, bounded data streams that are subject to be transferred over IEG or cross-domain.

Verification Method: Analysis

Requirement ID: IKM-SRS-482

The IKM Tools shall be able to send information products to the IEG-C for NATO Secret to Mission Secret information distribution.

Verification Method: Analysis

Requirement ID: IKM-SRS-483

The IKM Tools shall maintain releasability information for each piece of information across the IKM Tools Services.

Verification Method: Test

Requirement ID: IKM-SRS-484

The IKM Tools shall support Security Labelling elements upon information entity entry and create the corresponding Security Classification using approved NATO labelling standards for each Information Element. 'Entry' refers to direct creation in the IKM Tools; entities imported from an external system/file shall be required to have security labels.

Verification Method: Test

4.3.2.1.3 Windows Domain Services

Windows Domain Services provide Security and Directory Services to the Bi-SC AIS Domain.

Requirement ID: IKM-SRS-485

The IKM Tools shall integrate with the Bi-SC AIS Directory Services Active Directory.

Verification Method: Analysis

Requirement ID: IKM-SRS-486

If the IKM Tools requires a schema change, these schema extensions shall be documented. Any changes to the schema shall be submitted for approval to the Purchaser during the Design Stage.

Verification Method: Test

Requirement ID: IKM-SRS-487

The IKM Tools shall be compatible with Active Directory services and protocols.

Verification Method: Test

Requirement ID: IKM-SRS-488

The IKM Tools shall support integration with Windows File and Print Services (including publishing and lookup through Active Directory).

Verification Method: Inspection

Requirement ID: IKM-SRS-489

The IKM Tools shall support integration with Windows built-in services (e.g., Domain Name System (DNS), Internet Information Services, RUP, Terminal Server).

Verification Method: Inspection

Requirement ID: IKM-SRS-490

The IKM Tools shall support integration with Windows Security Services.

Verification Method: Inspection

Requirement ID: IKM-SRS-491

The IKM Tools shall support integration with Active Directory-supported security access control (e.g., ACL, security groups).

Verification Method: Inspection

Requirement ID: IKM-SRS-492

The IKM Tools shall be able to operate with the latest security settings from the NCIRC without change.

Verification Method: Inspection

4.3.2.1.3.1 Malware Detection Services

Requirement ID: IKM-SRS-493

The IKM Tools will be able to run with the available Malware Detection Services and anti-virus software.

Verification Method: Test

Requirement ID: IKM-SRS-494

The IKM Tools shall coexist (i.e. work correctly and not adversely impact other applications) with Bi-SC AIS standard Anti-Virus software during installation and operation.

Verification Method: Test

Requirement ID: IKM-SRS-495

The IKM Tools shall be equipped with security software that can detect malicious software contained in files of the IKM Tools-delivered workstations and servers. The software shall have the ability to scan any file or directory to detect any malicious software. The supplied software shall be compatible with the NATO Anti-Virus management centre and approved by the Purchaser.

Verification Method: Test

4.3.2.2 NATO Bi-SC AIS Deployable CIS

4.3.2.2.1 Introduction

NATO DCIS provides a deployable Communications and Information Systems (CIS) capability for deployed forces. DCIS provides CIS capabilities in-theatre and extends services from the fixed infrastructure to deployed users.

DCIS will support the full range of required CIS services at the deployed HQ. These CIS services include communication and the Bi-Strategic Command Automated Information Services (Bi-SC AIS) core and functional services. The communication services provide telephony, video conferencing and fax. The core services provide standard office automation including email and data transfer. The Functional services provide services specific military functions. To support deployed operations which may involve C2 participants from Nations which cannot be cleared for access to NATO SECRET (NS) information, it is necessary for the DCIS C2 nodes to support a MISSION SECRET (MS) domain. A NS domain is still required to support NATO activities and a NATO UNCLASSIFIED (NU) domain is required to support sharing of information in an unclassified environment.

NATO will provide the operational command structure of NATO lead expeditionary operations:

- Multinational Force, rotational
- Mission usually involves forces from non-NATO Nations
- Liaison with local governments, NGO, etc.
- 3 information security domains (plus national domains), namely:
 - Mission Secret (default secret mission execution domain, comparable to ISAF Secret),
 - Mission Unclassified
 - NATO Secret

NATO expeditionary operations have the following characteristics:

- Rapidly deployable
- NTM from 2 to 30 days
- Roll-on Roll-off to tactical airlift
- Deployment of forces and HQ structure mission tailored:
- Small mobile teams
- Deployable HQ from 50 to 500 users
- Disaster relief to Corps size operation
- Every mission is different, and never as planned. For this reason, Deployable CIS (DCIS) have to maximize modularity, scalability and flexibility.
- Sustainable with not host nation support

Once a mission is started, all relevant pre-mission information is transferred into the MS Mission Anchor Point. Operational users from the static environment continue mission preparation in the MS environment, while the deployable nodes that will support the mission are selected and prepared. (note that for missions engaging the NRF-in-standby this nodal selection and preparation is already done during the NRF preparation phase).

Once the deployable nodes that support the deployable C2 are selected and prepared, all mission applications required for the deployable C2 Entity (JFT HQ and JSLG in the example) and the related databases will be installed on the deployable nodes, and while still in garrison, all preparation data will be synchronised to those nodes.

When the node deploys into theatre, the applications and databases are not reachable, but planning and preparation by the operational users, still in their peacetime HQ, continues using the MAF.

Phase 3: DCMs deploy forward, deployed node contains primary COI database



FAS capabilities will be made available to the users through two options; a full-feature web-based application running on the existing NATO Security Domains (NS, MS and PAN, when applicable) and an equal full-feature client application (for those situations where higher responsiveness is needed, where network latency is too high or where reach-back connectivity is not available).

Any contractor involved in the development of a FAS capability that is meant to be deployable will define and develop test programs, plans, and procedures and conduct testing, oriented specifically to test the deployability of the system, as well as evaluate and document the results. The hardware, software, testing equipment, supplies, facilities, and personnel will be available and in place to conduct or support each test. For acceptance and operational testing, the test data will also be included, and mimic the anticipated operational quantities and sizes of information objects that will be identified in the NATO FAS NFRs. These tests will be performed in an existing or new DCIS Reference environment that accurately simulates the latency and bandwidth network conditions of the deployable DCIS infrastructure.

4.3.2.2.3 IKM Tools Requirements

The services that are actually provisioned on a DCIS node will depend on the nature of the mission involved. It is anticipated that a single DCIS node will vary between requiring the full suite of IKM Tools services (comparable to a Data Centre), selected IKM Tools Services (comparable to an Enhanced Node) or none (a Standard Node).

Requirement ID: IKM-SRS-496

The IKM Tools shall be able to run on the DCIS platform.

Verification Method: Test

Requirement ID: IKM-SRS-497

The IKM Tools shall be deployed depending on the type of DCIS node. A single DCIS node shall vary between:

Verification Method: Analysis

- full suite of IKM Tools services (comparable to a Data Centre),
- selected IKM Tools Services (comparable to an Enhanced Node) or
- none (a Standard Node).

4.3.2.2.3.1 Infrastructure Requirements

Requirement ID: IKM-SRS-498

DCIS must provide equipment to host the NATO Bi-Strategic Command Automated Information Services (Bi-SC AIS) Functional Services, along with any requisite supporting infrastructure. DCIS must also both host and provide Bi-SC AIS Core Services. (The AIS Functional Services applications themselves are provided from outside the DCIS programme). The AIS services must be able to have access to the communications network to allow interaction between elements of the AIS services and to enable the services to be

accessed by users. This equipment is grouped into the μ ISM subsystem. Each security domain is served by a separate μ ISM module.

Verification Method: Analysis

Requirement ID: IKM-SRS-499

The backend deployment for NATO locations shall be done using the NATO Infrastructure (Processing, Storage, Networking) Services.

Verification Method: Analysis

Requirement ID: IKM-SRS-500

The IKM Tools shall be deployable in a virtualised server MS Hyper-V and VM Ware virtualised environments

Verification Method: Test

4.3.2.2.4 Quality Requirements

4.3.2.2.4.1 Portability

Requirement ID: IKM-SRS-501

Any instance or application of The IKM Tools shall be able to be centrally configured to use a specific remote or local authorisation and authentication node.

Verification Method: Test

4.3.2.2.4.2 Usage scope and limitations

Requirement ID: IKM-SRS-502

The IKM Tools shall not bear additional licences and charges for deployment of the IKM Tools Product if used in a NATO context (exercise, mission, static and deployable commands, NRF).

Verification Method: Inspection

4.3.2.2.4.3 Availability

In the deployed IKM Tools, five levels of network degradation will be considered due to outages and/or jamming:

- Normal: 90%-100% of the throughput available
- Degraded: 70%-90% of the throughput available
- Severely Degraded: 10%-70% of the throughput available
- Minimum: >0%-10% of the throughput available
- Off-line: 0% of the throughput available

A **degraded network mode of operation** is when the mission-specific WAN or mission-specific LAN is providing a reduced level of service that may impact one or more of the

IKM Tools services (or Application and Interface Products). Reduction in service may be due to bandwidth limitations or a communication degradation affecting some part of the LAN and/or WAN.

Requirement ID: IKM-SRS-503

If the IKM Tools deployed kit cannot connect to the WAN due to communication system failure, bad weather or operational restrictions (e.g. EMCON), the IKM Tools will change the mode of operation to Standalone and continue its operation with limited functionality.

Verification Method: Test

Requirement ID: IKM-SRS-504

A local data storage shall be available in each deployable IKM Tools entity, so that service use and mission execution can continue even if the node is disconnected from the Wide Area Network.

Verification Method: Test

Requirement ID: IKM-SRS-505

The IKM Tools shall queue pending asynchronous ((i.e. do not need immediate feedback) requests to an unavailable service and deliver them when the Service becomes available again (restoring normal functioning).

Verification Method: Test

4.3.2.2.4.4 Maintainability

Requirement ID: IKM-SRS-506

Each deployable IKM Tools entity shall have the capability to be operated by local administration and management, so that if a node is isolated from the central support, local administration and management can be executed.

Verification Method: Test

Requirement ID: IKM-SRS-507

The IKM Tools preparation for deployment and movement shall not take more than 5 days from receiving the Notice to Move until the equipment is packed up ready to move.

Verification Method: Test

4.3.2.2.4.5 Interface Requirements

Once the deployable nodes that support the deployable C2, here IKM Tools, are selected and prepared, all mission applications required for the deployable C2 Entity and the related databases will be installed on the deployable nodes, and while still in garrison, all preparation data will be synchronised to those nodes. It shall be required to switch the roles of the databases. In the early phases, the main database is the in the Mission Anchor Function, and the secondary is the one in the node in garrison. When a node in garrison is deployed, these roles may change.

Requirement ID: IKM-SRS-508

The IKM Tools data resynchronisation in deployment after long periods off-net shall resolve consistency conflicts.

Verification Method: Test

Requirement ID: IKM-SRS-509

The IKM Tools shall implement data compression that guarantees an efficient use of network bandwidth.

Verification Method: Test

Requirement ID: IKM-SRS-510

The IKM Tools shall implement incremental database synchronization communication protocol that guarantees an efficient use of network bandwidth.

Verification Method: Analysis

Requirement ID: IKM-SRS-511

The IKM Tools shall not encrypt WAN data exchange.

Verification Method: Test

4.3.3 Co-existence Requirements

Co-existence is the degree to which a product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.

Requirement ID: IKM-SRS-512

The IKM Tools shall operate with other Bi-SC AIS Functional Services in the same environment without causing any error condition in itself or in other systems.

Verification Method: Test

4.4 Design Constraints

4.4.1 Architectural Constraints

4.4.1.1 General

Requirement ID: IKM-SRS-513

The IKM Tools shall be compliant with the standards given in the SoW section Applicable Documents. Any proposed deviation shall be approved by the Purchaser.

Verification Method: Analysis

Requirement ID: IKM-SRS-513b

The IKM Tools shall be compliant with the Microsoft supportability limitations so that the recommended limitation are not breached, i.e. maximum number of Sites per Site Collection or maximum Content Database size) (see Ref. [Software boundaries and limits for SharePoint Servers 2016 and 2019]). Any proposed deviation shall be approved by the Purchaser.

Verification Method: Analysis

Requirement ID: IKM-SRS-514

The IKM Tools shall be designed and implemented with economy of bandwidth (e.g., caching, light-weight previewing, metadata exchange, lazy loading).

Verification Method: Analysis

Requirement ID: IKM-SRS-515

The proposed software architecture, development environment, middleware system and the separation of components (Human Machine Interface, Business and Data) for the IKM Tools shall be documented and explained in detail.

Verification Method: Analysis

Requirement ID: IKM-SRS-516

The IKM Tools shall expose selected functionality as Services, as components of a service-oriented architecture to encourage reuse and interoperability with other applications in a distributed way. The criteria used for selection of functionality shall be documented.

Verification Method: Analysis

Requirement ID: IKM-SRS-516b

The IKM Tools Search service shall be implemented as autonomous and separated from the IKM Tools, that is, as separated Share Point farm following the Microsoft best practices.

Verification Method: Analysis

Requirement ID: IKM-SRS-516c

The IKM Tools Search service in ON shall be implemented as a Medium Search Farm following the Microsoft Guidelines (ref: [Plan enterprise search architecture in SharePoint Server]).

Verification Method: Analysis

Requirement ID: IKM-SRS-517

The IKM Tools services shall comply with the C3 Classification Taxonomy and applicable Service Interface Profiles.

Verification Method: Analysis

Requirement ID: IKM-SRS-518

The IKM Tools shall, where applicable, make use of REST architecture to make resources available over a URL in promotion of interoperability.

Verification Method: Analysis

Requirement ID: IKM-SRS-519

The IKM Tools design process shall balance design implementation with cost for implementation and support to minimise life cycle cost. The IKM Tools design shall take into account the technical, support and cost impacts for NATO.

Verification Method: Analysis

4.4.1.2 Browser-based Functionality

Requirement ID: IKM-SRS-520

The IKM Tools user functionality shall be browser-based, except as specifically waived by the Purchaser.

Verification Method: Inspection

Requirement ID: IKM-SRS-521

The IKM Tools user functionality shall require only an ordinary browser and should not require the installation of additional software, components or plug-ins on the user workstation, except as specifically waived by the Purchaser.

Verification Method: Test

4.4.1.3 COTS selection and integration

Requirement ID: IKM-SRS-522

The IKM Tools shall be based on COTS in its architecture in place of dedicated solutions when the functionalities of a COTS matches the requirements for a Service with no or minimal adaptation.

Verification Method: Analysis

Requirement ID: IKM-SRS-523

When no or minimal adaptation is necessary for the COTS integration, the IKM Tools shall use COTS with no additional layer to masquerade nor shield the COTS and the complete functionalities of the COTS shall be available to the IKM Tools Services.

Verification Method: Analysis

Requirement ID: IKM-SRS-524

The IKM Tools adaptations shall be delivered as additional Services that complement the COTS native functionalities.

Verification Method: Analysis

4.4.2 Data Management

4.4.2.1 General

Requirement ID: IKM-SRS-525

The IKM Tools shall utilise a Database Management System (DBMS) to manage all internal storage (some configuration files can be excluded).

Verification Method: Analysis

Requirement ID: IKM-SRS-526

The IKM Tools DBMS shall be compatible with NATO Infrastructure.

Verification Method: Analysis

Requirement ID: IKM-SRS-527

The IKM Tools database shall support backup and archiving. The backup and archive shall be full, incremental backups and archives of the IKM Tools data. The backup and archive shall be performed both automatically at a configurable frequency and manually by the authorised User.

Verification Method: Test

Requirement ID: IKM-SRS-528

The IKM Tools shall support recovery facilities of the database from backup and archive data.

Verification Method: Test

Requirement ID: IKM-SRS-529

The IKM Tools shall provide ADO.NET and ODBC database interfaces.

Verification Method: Analysis

4.4.2.2 Data Modelling

Requirement ID: IKM-SRS-530

The IKM Tools shall have a documented Conceptual, Logical and Physical data model

Verification Method: Analysis

Requirement ID: IKM-SRS-531

The IKM Tools shall use a standard naming convention for the database design.

Verification Method: Analysis

4.4.2.3 Data Replication

The basic function of the data replication capability is to make the same planning data or operational data available on both the source and destination databases on different servers separated by a wide area network. Replication can also simply have redundancy purposes.

Requirement ID: IKM-SRS-532

The IKM Tools shall provide the necessary mechanisms to ensure complete, accurate, timely, confidential and consistent data coherence between the different distributed Organizational Nodes of the system.

Verification Method: Analysis

Requirement ID: IKM-SRS-533

The IKM Tools shall use the ITM replication mechanism (aka: Metalogix, or iOra) to replicate the data from SHAPE Data Center to the Lago Patria Data Center so that the IKM Tools availability and Fault Tolerance KPIs are met.

Verification Method: Test

Requirement ID: IKM-SRS-534

The IKM Tools data replication shall be:

Verification Method: Analysis

- Synchronous: the IKM Tools shall automatically replicate information held in a source database only when it is created/changed/deleted, and that is recognised by the replication mechanism. It shall replicate to all co-operating systems/nodes that have been configured to exchange this information.
- Asynchronous: the IKM Tools shall allow an authorised User to specify intervals of replication.

Requirement ID: IKM-SRS-535

The IKM Tools shall allow an authorised User to selectively identify the data to be replicated.

Verification Method: Test

Requirement ID: IKM-SRS-536

The IKM Tools shall allow the IKM Tools System Administrators to configure authoritative sources of data, and the destination databases (i.e., what systems/nodes) to which data is to be replicated.

Verification Method: Test

4.4.3 Graphical User Interface (GUI)

4.4.3.1 NCIA and NATO guidelines

Bi-SC AIS applications are developed as projects within NCIA to be used by NATO users. Both NCIA and NATO have their own standards and guidelines that will influence or directly affect Bi-SC AIS applications' visual design. Although Bi-SC AIS applications can have their own identity, any new application needs to feel like other products NCIA or NATO have previously created and share the same organizational values.

Requirement ID: IKM-SRS-537

The IKM Tools visual design shall follow the recommendations and guidelines stated in the following documents:

- NATO Visual Identity Guidelines
- NCIA Visual Identity Guidelines

Verification Method: Inspection

Requirement ID: IKM-SRS-538

The IKM Tools shall follow the recommendations and guidelines of the HMI Style Guide for C4ISR Rich Applications regarding to windows and layouts, user interactions, user support and feedback, common user interface components design, visual design and text use.

Verification Method: Inspection

4.4.3.2 ISO standards

Requirement ID: IKM-SRS-539

The IKM Tools icons included in the designed solution shall be compliant with the ISO 18152 standard series.

Verification Method: Analysis

Requirement ID: IKM-SRS-540

The IKM Tools shall be compliant with the ISO 9241 standard series. In particular:

Verification Method: Analysis

Requirement ID: IKM-SRS-541

The IKM Tools shall be compliant to ISO 9241-125 for the presentation of information.

Verification Method: Analysis

Requirement ID: IKM-SRS-542

The IKM Tools shall be compliant to ISO 9241-13 for user guidance.

Verification Method: Analysis

Requirement ID: IKM-SRS-543

The IKM Tools shall be compliant to ISO 9241-14 for menu dialogues.

Verification Method: Analysis

Requirement ID: IKM-SRS-544

The IKM Tools shall be compliant to ISO 9241-143 for form filling dialogues

Verification Method: Analysis

Requirement ID: IKM-SRS-545

The IKM Tools shall be compliant to ISO 9241-171 for accessibility.

Verification Method: Analysis

Requirement ID: IKM-SRS-546

The IKM Tools shall follow the dialogue principles stated in ISO 9241-110 or ISO/DIS 9241-110 (if available)

Verification Method: Analysis

4.4.3.3 Log-on procedures

Requirement ID: IKM-SRS-547

In applications where users must log-on to the system, log-on shall be a separate procedure that must be completed before a user is required to select among any operational options.

Verification Method: Analysis

Requirement ID: IKM-SRS-548

Appropriate prompts for log-on should be automatically displayed on the user's terminal when accessing the application.

Verification Method: Analysis

Requirement ID: IKM-SRS-549

User identification procedures shall be as simple as possible, consistent with adequate data protection.

Verification Method: Analysis

Requirement ID: IKM-SRS-550

When required, the password shall not be echoed on the display. An asterisk (*) or similar symbol will be displayed for each character when inputting secure passwords during log-on.

Verification Method: Analysis

Requirement ID: IKM-SRS-551

When passwords are required, users shall be allowed to choose their own passwords since a password chosen by a user will generally be easier for that individual to remember. Guidelines for password selection shall be given so that users will not choose easily guessable ones.

Verification Method: Analysis

Requirement ID: IKM-SRS-552

Users should be allowed to change passwords whenever they choose; all passwords should be changed at periodic intervals (not to exceed a configurable number of months).

Verification Method: Analysis

Requirement ID: IKM-SRS-553

Users shall be provided feedback relevant to the log-on procedure that indicates the status of the inputs.

Verification Method: Analysis

Requirement ID: IKM-SRS-554

If a user cannot log-on to a system, a prompt should be provided to explain the reason for this inability. Log-on processes should require minimum input from the user consistent with the requirements prohibiting illegal entry.

Verification Method: Analysis

4.4.3.4 Log-off procedures

Requirement ID: IKM-SRS-555

When a user signals for system log-off, or application exit or shut-down, the system should check pending transactions to determine if data loss seems probable. If so, the computer should prompt for confirmation before the log-off command is executed.

Verification Method: Test

4.4.3.5 Data entry

Requirement ID: IKM-SRS-556

Data entry functions shall be designed to establish consistency of data entry transactions, minimize input actions and memory load on the user, ensure compatibility of data entry with data display, and provide flexibility of user control of data entry.

Verification Method: Inspection

Requirement ID: IKM-SRS-557

Data entries should be validated by the system for correct format, legal value, or range of values. Where repetitive entry of data sets is required, data validation for each set should be completed before another transaction can begin.

Verification Method: Test

Requirement ID: IKM-SRS-558

The user shall not be required to enter data already available to the software.

Verification Method: Inspection

Requirement ID: IKM-SRS-559

The IKM Tools shall support copying and pasting from other applications via the Clipboard (including text and graphics).

Verification Method: Test

Requirement ID: IKM-SRS-560

The IKM Tools shall allow users to edit Metadata in bulk so that user can see and modify at least 100 list items (i.e. via window scrolling).

Verification Method: Test

4.4.3.6 Data and content display

Requirement ID: IKM-SRS-561

In the IKM Tools, user-accessed information shall be filtered according to the user's role and organization, so that Users can only see what they are allowed to view and/or change (including both data and functionality).

Verification Method: Inspection

Requirement ID: IKM-SRS-562

Data and content displayed shall follow the Windows and Layout recommendations of the HMI Style Guide for Rich C4ISR Applications

Verification Method: Analysis

Requirement ID: IKM-SRS-563

The IKM Tools shall provide cursor control capability via a Cursor Control Device (mouse or similar). The response of a cursor to control movements shall be consistent, predictable, and compatible with the user's expectations.

Verification Method: Inspection

Requirement ID: IKM-SRS-564

Data deletion or cancellation shall require an explicit action, such as depressing a DELETE key. Permanent deletion (in absence of an "undo" function) of more

than one character shall not be allowed without an affirmative response to an "are you sure?" type of query.

Verification Method: Inspection

4.4.3.7 Default values

Requirement ID: IKM-SRS-565

Default values shall be used to reduce user workload. Currently defined default values should be displayed automatically in their appropriate data fields with the initiation of a data entry transaction and the user shall indicate acceptance of the default.

Verification Method: Test

Requirement ID: IKM-SRS-566

The IKM Tools shall provide auto-completion feature with session-available information to be filled automatically by the IKM Tools (i.e., date/time, name and other profile information of the User, classification). This shall apply to "entry fields" (including text-fields, drop down lists, radio-buttons).

Verification Method: Inspection

Requirement ID: IKM-SRS-567

The user should have the option of generating default values based on operational experience if the systems designer cannot predefine appropriate values.

Verification Method: Inspection

Requirement ID: IKM-SRS-568

The user shall be able to replace any default value during a given transaction without changing the default definition.

Verification Method: Test

4.4.3.7.1 Error management and data protection

Requirement ID: IKM-SRS-569

Where users are required to make entries into a system, an easy means shall be provided for correcting erroneous entries. The system shall permit correction of individual errors without requiring re-entry of correctly entered commands or data elements.

Verification Method: Test

Requirement ID: IKM-SRS-570

A capability should be provided to facilitate detection and correction of errors after keying in, but before entering into the system. While errors should be detected early, error checking should occur at logical data entry breaks, e.g., at

the end of data fields rather than character-by-character, in order to avoid disrupting the user.

Verification Method: Test

Requirement ID: IKM-SRS-571

Provision shall be made to prevent accidental actuation of potentially destructive control actions, such as accidental erasure or memory dump.

Verification Method: Test

4.4.3.7.2 Individualization

Requirement ID: IKM-SRS-572

Mechanisms shall be provided to allow the characteristics of the IKM Tools to be modified by the user to take account of the diversity of user characteristics, where such needs typically occur.

Verification Method: Analysis

Requirement ID: IKM-SRS-573

The IKM Tools shall allow Users to quickly revisit recent functions and features and to save 'favourites' of features and functions that are often used.

Verification Method: Analysis

Requirement ID: IKM-SRS-574

The IKM Tools shall allow the User to set up personal preferences for layout and content.

Verification Method: Test

Requirement ID: IKM-SRS-575

In the IKM Tools, the feature to change the user interface appearance shall be visible and accessible on every screen.

Verification Method: Test

Requirement ID: IKM-SRS-576

The IKM Tools shall provide a list of the 'last accessed items' or recently used items/functions. This list shall always be selectable for display.

Verification Method: Test

Requirement ID: IKM-SRS-577

The IKM Tools shall persist user customization settings.

Verification Method: Test

4.4.4 Software Design

4.4.4.1 General

Requirement ID: IKM-SRS-578

The IKM Tools shall be designed to work in the ITM ON and PBN environments as consumers and providers of other Functional Services and Core Services.

Verification Method: Test

Requirement ID: IKM-SRS-579

The IKM Tools shall comply with latest versions of the Microsoft Windows operating system available and supported by the ITM servers and workstations. This should include all versions of the operating systems planned to become available for the ITM prior to the Integration Tests.

Verification Method: Test

4.4.4.2 Programming Languages and Technologies

Requirement ID: IKM-SRS-580

The IKM Tools shall comply with the language specifications and versions compatible with ITM and described below, and with the AFPL. Any variations from the languages or specifications shall be agreed with the Purchaser:

Verification Method: Inspection

- .NET
- C++ [ISO/IEC 14882]
- C# [ISO/IEC 23270:2003]
- Common Language Infrastructure (CLI) [ISO/IEC 23271:2003 and ISO/IEC 23272:2003]
- Java [JSR 379]
- JavaScript [ECMA 262]
- HTML [ISO/IEC 15445, 2000]

4.4.4.3 Coding Standards

Requirement ID: IKM-SRS-581

Whilst the specifics of coding syntax are not specified, a convention shall be adopted and applied consistently across all code artefacts for each programming language employed.

Verification Method: Inspection

Requirement ID: IKM-SRS-582

Source code artefacts delivered for the IKM Tools shall be written using Standard English (e.g. for Classes, Methods, Variables etc.). Industry coding best practices shall be used.

Verification Method: Inspection

Requirement ID: IKM-SRS-583

The IKM Tools .Net components shall be developed in compliance of the following Microsoft Visual Studio Code Analysis Tool rule sets:

Verification Method: Inspection

- Microsoft Basic Correctness Rules
- Microsoft Basic Design Guideline Rules
- Microsoft Extended Correctness Rules
- Microsoft Extended Design Guideline Rules
- Microsoft Minimum Recommended Rules
- Microsoft Security Rules

Requirement ID: IKM-SRS-584

Valid exceptions to those rules shall be created for each applicable occurrence (e.g. global exclusion is not allowed unless explicitly approved by the Purchaser)

Verification Method: Inspection

Requirement ID: IKM-SRS-585

All custom code methods shall have a Unit Test defined and included in the delivered package to the Purchaser.

Verification Method: Analysis

4.4.4.4 Code Documentation

Requirement ID: IKM-SRS-586

Source code delivered for the IKM Tools shall be documented with in-line comments using Standard English. Commercial best practices shall be used in the level of commenting.

Verification Method: Inspection

Requirement ID: IKM-SRS-587

Comments for the source code of the IKM Tools shall be used to clarify intent of the code and shall be provided for:

Verification Method: Inspection

- Each class definition explaining the purpose of the class
- Each member function explaining what the function does, its inputs and outputs
- Each member variable explaining what the variable means
- Each type definition (enums) explaining what the type represents

Requirement ID: IKM-SRS-588

Comments for the source code of the IKM Tools shall be able to be automatically extracted and formatted to augment technical documentation.

Verification Method: Inspection

Requirement ID: IKM-SRS-588b

Every method of every class shall contain at minimum the following comments on the header of the method, using the following template:

Verification Method: Inspection

```
<summary>
/// short description mentioning the purpose of this method
/// </summary>
/// <param name="FieldInternalName">the value</param>
/// <param name="anotherInternalName">the valueparam>
/// <returns>value returned</returns>
```

Requirement ID: IKM-SRS-588c

The source code provided by the Contractor shall conform to the coding conventions stated with the “C# Coding Conventions”

Verification Method: Inspection

Requirement ID: IKM-SRS-588d

The Contractor shall provide an API reference conforming to the “General API Reference Code Comments”

Verification Method: Inspection

4.4.4.5 Registry Settings

Requirement ID: IKM-SRS-589

All usage of the Windows Registry by the IKM Tools applications shall be fully documented, and requires approval by the *Purchaser* not later than the Design Stage.

Verification Method: Inspection

4.4.5 Free and Open Source software (FOSS)

Requirement ID: IKM-SRS-590

FOSS components in the IKM Tools shall comply with the NATO strategy on the use of Open Source Software in NATO systems.

Verification Method: Analysis

Requirement ID: IKM-SRS-591

Any IKM Tools components based on free and open source software shall be provided with the source code for the FOSS. The source code shall correspond to the delivered component (i.e., same version), and the component shall be capable of being built from the delivered source code.

Verification Method: Analysis

Requirement ID: IKM-SRS-592

Use of a FOSS component shall not limit the deployment or use of the IKM Tools in any way and shall not require the release of code developed for the IKM Tools.

Verification Method: Analysis

4.5 Technical Documentation Requirements

4.5.1 General

The requirements describing which technical documentation shall be developed and how the technical documentation shall be managed and taken under configuration control are in the SoW. This section of the SRS will cover the requirements which are applicable to the online technical documentation.

Requirement ID: IKM-SRS-593

The general requirements for technical documentation developed in the SoW shall also apply to the on line documentation.

Verification Method: Analysis

Requirement ID: IKM-SRS-594

The IKM Tools on-line User documentation and help system shall be compliant with standards identified under section "Applicable Standards".

Verification Method: Analysis

4.5.2 Technical Documentation

4.5.2.1 On-line Help

4.5.2.1.1 General

The IKM Tools will be used by organizations in various time zones throughout NATO territories and other areas of NATO operations. During crisis use of the IKM Tools will be high and over extended working hours. Full on-line help capability will be required to supplement the IKM Tools help-desks.

Requirement ID: IKM-SRS-595

The IKM Tools shall support on-line help describing all functionality of the IKM Tools capability (i.e. publishing the delivered User and Administration Manuals).

Verification Method: Inspection

Requirement ID: IKM-SRS-596

The IKM Tools on-line help shall translate every use case and usage scenario into a browsing sequence. Every browsing sequence shall be structured according to the User workflow.

Verification Method: Inspection

Requirement ID: IKM-SRS-597

The IKM Tools on-line help shall describe each the IKM Tools function, the interrelationships between and the logical sequence of functions.

Verification Method: Inspection

Requirement ID: IKM-SRS-598

The IKM Tools on-line help shall explain all menu items, dialog windows, data entry and query fields implemented in the IKM Tools Product Baseline.

Verification Method: Inspection

Requirement ID: IKM-SRS-599

The IKM Tools on-line help shall include a glossary providing definitions of all terms and acronyms implemented in the IKM Tools Product Baseline.

Verification Method: Inspection

Requirement ID: IKM-SRS-600

All definitions in the IKM Tools glossary shall be available in roll-over, pop-up windows linked to every appearance in on-line help of the corresponding term or acronym.

Verification Method: Inspection

Requirement ID: IKM-SRS-601

In the IKM Tools, each dialogue, menu item, toolbar item, function, field or button (each item on the screen) shall have an on-line help option. This shall be clearly visible, but not intrusive.

Verification Method: Inspection

Requirement ID: IKM-SRS-602

The IKM Tools on-line help shall be concise, compact and clear to the User.

Verification Method: Inspection

Requirement ID: IKM-SRS-603

The on-line help shall include snapshots of the IKM Tools screens, windows, and dialogue boxes. The snapshots shall be provided in a suitable lightweight format (e.g., GIF, PNG) approved by the Purchaser.

Verification Method: Inspection

Requirement ID: IKM-SRS-604

Pictures in the IKM Tools on-line help showing more than five GUI elements/controls shall have a clickable image map describing each element.

Verification Method: Inspection

Requirement ID: IKM-SRS-605

If the IKM Tools on-line help topic requires a large picture that does not fit on a normal page, a reduced copy shall be additionally included on the Help page that will expand to its full size on User request.

Verification Method: Inspection

Requirement ID: IKM-SRS-606

The IKM Tools on-line help shall be context-sensitive (i.e., based on a specific point in the state of the software and providing help for the situation that is associated with that state on action being performed).

Verification Method: Inspection

Requirement ID: IKM-SRS-607

In the IKM Tools, all source code elements shall be configured to link the GUI elements to their context-sensitive topics.

Verification Method: Inspection

Requirement ID: IKM-SRS-608

The IKM Tools shall contain help functions that provide access to interactive training sessions to guide Users through procedures and functions.

Verification Method: Inspection

Requirement ID: IKM-SRS-609

The IKM Tools on-line help shall be given by a small pop-up screen or info tip screen. This screen shall appear quickly and be very easy to hide, for instance clicking anywhere within it.

Verification Method: Inspection

Requirement ID: IKM-SRS-610

The IKM Tools shall be able to display search query results for finding help items in the online help in a list. The IKM Tools shall display the help item when the User selects a query result in this list.

Verification Method: Test

4.5.2.2 Frequently Asked Questions (FAQ)

Requirement ID: IKM-SRS-611

The IKM Tools shall provide a list of Frequently Asked Questions.

Verification Method: Inspection

Requirement ID: IKM-SRS-612

The IKM Tools shall allow the User to search the IKM Tools FAQ

Verification Method: Test

4.6 Computer Resource Constraints

4.6.1 Hardware and Software Components ITM

Requirement ID: IKM-SRS-613

The IKM Tools shall be able to run on NATO-provided infrastructure including virtual servers and operational workstations.

Verification Method: Analysis

Requirement ID: IKM-SRS-614

The IKM Tools shall be compatible with the x86-64 architecture (32-64 bit applications).

Verification Method: Analysis

Requirement ID: IKM-SRS-615

The IKM Tools shall support the following environment configuration for the server components:

Verification Method: Analysis

- Operating System: Microsoft Windows Server.
- Database Server: Microsoft SQL Server
- Web Server: Internet Information Services (IIS)

Requirement ID: IKM-SRS-616

The IKM Tools shall use virtualized infrastructure components (processing, storage, local area networking, monitoring, management and security) with a resource definition equivalent to the requirements defined in NATO Bi-SC AIS Minimum Hardware Procurement Specifications (MHWPS), when applicable. The allocation of virtualized infrastructure components shall be approved by the purchaser.

Verification Method: Analysis

Requirement ID: IKM-SRS-617

The infrastructure requirements of a service or application shall not be designed and deployed with a "per service, per application" approach but shall be covered through a harmonized "infrastructure services" approach applicable to all services and applications making use of the infrastructure services.

Verification Method: Analysis

Requirement ID: IKM-SRS-618

The IKM Tools software shall run on NATO Server Baseline (see Ref [MHWPS], [BAPPL12] and [AFPL]).

Verification Method: Inspection

Requirement ID: IKM-SRS-619

The IKM Tools software shall not have any direct dependency to the physical parameters of the storage environment (such as disk type, connection type, SAN topology, SAN protocol).

Verification Method: Inspection

Requirement ID: IKM-SRS-620

The IKM Tools software shall not have any hard coded UNC, File Path, Drive Letter or similar storage location settings.

Verification Method: Inspection

Requirement ID: IKM-SRS-621

All UNC, File Path, Drive Letter or similar storage location settings shall be parametric, configurable, and possible to automate for unattended installation, backup, recovery.

Verification Method: Inspection

Requirement ID: IKM-SRS-622

The IKM Tools software shall have no hard coded URL, DNS or IP Address settings. All URL, DNS, IP Addressing and similar network settings shall be parametric, configurable, and possible to automate for unattended installation, backup, recovery.

Verification Method: Inspection

Requirement ID: IKM-SRS-623

The server deployment package (virtual appliance or installation package) shall be tested against the following hypervisors, configured in accordance with NATO Security Settings:

Verification Method: Analysis

- VMWare ESX
- Microsoft Hyper-V

Requirement ID: IKM-SRS-624

The IKM Tools Client functionality shall be compliant with the NATO Desktop Baseline. Including:

Verification Method: Test

- MS Windows Operating system
- MS Office
- MS Edge browser and MS Internet Explorer
- Adobe Acrobat Reader
- Java Virtual Machine
- McAfee Anti-Virus and Data Loss Prevention (DLP) agent
- NCIRC desktop Host-based Intrusion Detection System (HIDS) and Forensics analysis based agents
- VPN client for PBN mobile client devices; and
- Disk encryption for PBN mobile client devices

Requirement ID: IKM-SRS-625

The IKM Tools SMC integration shall be compliant with the NATO EMS.

Verification Method: Analysis

Requirement ID: IKM-SRS-626

The IKM Tools Servers shall be able to be deployed in the virtual environments running on:

Verification Method: Analysis

- Data Centres provided by the NATO IT Modernisation (ITM) project, in the static environment, and
- Micro Information Service Module (æISM) provided by NATO Response Force (NRF) Deployable Communications and Information Systems (DCIS) project, in the deployable configuration.

Requirement ID: IKM-SRS-627

The IKM Tools shall support replication and backup services provided by the Data Centres deployed by the NATO IT Modernisation (ITM) project.

Verification Method: Test

Requirement ID: IKM-SRS-628

The IKM Tools shall support multiple browsers, including the ITM provided browsers: Internet Explorer, Edge and Firefox

Index no. NCI Agency	IFB Source Document	IFB Paragraph Reference	Bidder's Question	Answers
CR #1	n/a	n/a	Could it be possible for you to provide us with the information which company completed Step 1 of the subject project.	CITI (NIP TT+) and CGI Germany (Migration/EDMS/Training)
CR #2	n/a	n/a	May I get the following current contract information to aid in their decision making:	
2.1	n/a	n/a	1. Incumbent Contractor	There is no incumbent contractor, this is a new project
2.2	n/a	n/a	2. Contract Price	See above
2.3	n/a	n/a	3. Contract Period of Performance	See above
2.4	n/a	n/a	4. Historical number of personnel required on-site and at which locations. (Will work visas be granted or should all work be required to be performed by Host Nation employees).	After approved design - 1 person from each contractor was on site. Need someone on site in location for each of the tools. 1-2 person for SAT
2.5	n/a	n/a	5. Historically, what percentage of work has been able to be performed remotely?	~20% for rollout. ~50% for remote farms.
CR #3	SOW § 3.3 System Requirements Review (SRR)	The requirement SOW 31 states: The Contractor shall propose the implementation sequence of the sites that form part of PSA in a Site Activation Plan.	Is the Site Activation Plan a deliverable to be provided? Will NATO provide a template?	SOW 31 is removed. SOW 26 remains the same. Yes - The Site Activation Plan is a required document for the contractor to deliver. A NATO Template is not provided, however, a sample document can be
CR #4	SOW § 3.3 System Requirements Review (SRR)	The requirement SOW 31 states: The Contractor shall propose the implementation sequence of the sites that form part of PSA in a Site Activation Plan, and the requirement SOW 32 states: The Contractor shall propose the implementation sequence of the sites that form FSA.	As all the site implementations are carried out by the PCA (EDC+18), according to the sheet CLIN Summary of the excel file IC_IFB-CO-15079-IAS - Book 1 Annex A Bidding Sheets v4_FINAL, it is not clear which are the sites that form the FSA. Could you please clarify?	Yes - Now SOW 30 - Completion of all site implementations forms FSA.
CR #5	SOW § 3.3 System Requirements Review (SRR)	The requirements SOW 31 and SOW 32 are a duplication respectively of the requirements SOW 27 and 28.	Could you please clarify?	Yes, removed SOW 31 and 32 and amalgamate these requirements in SOW 30. See Amended 1
CR #6	SOW	The row contains some requirements with missing reference link (Error! Reference source not found.)	Could you please clarify?	Yes, Fixed in Amendment 1
CR #7	Bidding Instructions §4.5.5.1.6, §4.5.5.1.7, §4.5.5.1.14	The paragraphs have a missing reference link (Error! Reference source not found.)	Could you please provide the right references?	Yes, Fixed in Amendment 1
CR #8	Bidding Instructions § 3.6 Technical proposal	The paragraph is empty and we have no information on how to prepare the technical proposal. Moreover, the paragraphs 4.5.5.1.10, 4.5.5.1.11, 4.5.5.1.15 and 4.5.5.1.32 refers to missing paragraphs 3.6.6.1.6, 3.6.6.1.7, and 3.6.6.1.16.	Could you please clarify?	Yes, Fixed in Amendment 1
CR #9	Bidding Instructions § 4.5 Step 3: Technical Compliance Evaluation	The numeration and the indentation of the sub-paragraphs of 4.5 seems incorrect and incomplete.	Could you please clarify?	Yes, Fixed in Amendment 1
CR #10	Bidding Instructions § 4.5.5.1.8	The paragraph states: The Bidder states it complies with all requirements in section 3.5 Technical Proposal. The Bidder provides all deliverables required in the Technical Proposal section 3.5 in the form that has been asked for (i.e.: format and completeness). The deliverables provided by the Bidder are meaningful and trustworthy to what is being asked for, that is, accurately provides the information is being requested.	We think that the statement should refer to § 3.6 and not §3.5. In any case being the §3.6 empty, we do not know which are the deliverable to be provided. (see question T.7) Could you please clarify?	Yes, Fixed in Amendment 1
CR #11	SOW § 14 Item G On-Site support	According the requirements [SOW 495] and [SOW 498]: the Contractor shall provide at least 2 FTE for the working hours, Monday to Friday, 8h30 to 17h30 CET for on-site support in Mons. Moreover the [SOW -499] specifies that in order to support the Purchaser's customers in different time zones from Mons, a reduced number of Contractor's manpower (at least 1 FTE) shall cover the following hours: a. Monday to Friday, 7h00 to 17h00 (UTC -05:00) b. Monday to Friday, 8h00 to 16h00 (UTC) c. Monday to Friday, 7h30 to 16h00 (UTC +01:00)	Shall the FTEs employed for satisfying requirement [SOW -499] be a subset of FTEs employed for satisfying requirement [SOW -495]? Could you please clarify?	FTE - Full Time Equivalent of a staff member
CR #12	SOW § 14 Item G On-Site support	According the requirements [SOW 495] and [SOW 498]: the Contractor shall provide at least 2 FTE for the working hours, Monday to Friday, 8h30 to 17h30 CET for on-site support in Mons. Moreover the [SOW -499] specifies that in order to support the Purchaser's customers in different time zones from Mons, a reduced number of Contractor's manpower (at least 1 FTE) shall cover the following hours: a. Monday to Friday, 7h00 to 17h00 (UTC -05:00) b. Monday to Friday, 8h00 to 16h00 (UTC) c. Monday to Friday, 7h30 to 16h00 (UTC +01:00)	Moreover, has the support for different time to be fully provided on site in Mons, taking into account that Monday to Friday, 7h00 to 17h00 (UTC -05:00) correspond to 14h00:00h00 (CET) and therefore the involved contractor personnel has to stay in Mons up to at 00:00 in the night? Could you please confirm that?	Confirmed
CR #13	1C_IFB-CO-15079-IAS - Book 1 Annex A Bidding Sheets v4_FINAL.xlsx	TAB Labour and Options Bidder is to identify specific labour categories, including function. This may also include level as appropriate. For example: Senior Systems Engineer, Technician, Junior program analyst, etc.	For several CLINs (e.g. CLIN 5.6.1.2 Site Survey (IKM Tools)) the Labour Category shall be given by the bidder. However, this and other CLINs will be done by a team of several specialist. What entry shall be given in the Labour Category column in this case? Is the bidder allowed to fill-in a short description, e.g. "Site Survey Team", and give as labour rate a mixed rate of the foreseen members of that team?	Where a multi-skilled (And multi-costs) team is involved, Bidder is allowed to add their own detailed worksheet into the workbook, detailing the cost build of the CLIN and its summary. The Agency issued worksheets can then point at the appropriate inserted sheet cell reference. This can be done for material lists or ODC also.
CR #14	IFB-CO-15079-IAS_Final_Biddingsheets.pdf 5.1.4.3	Bidders shall make sure that they have filled all delivery dates in yellow ...	The CLIN Summary Tab does not have any yellow field for delivery dates. Shall the bidder fill-in column D (Required Days after Effective date of Contract (DAEDC)) instead?	Yes - The Cells have been changed to yellow. Please fill in Column D of the Clin Summart Tab.
CR #15	IFB-CO-15079-IAS_Final_SOW.docx SOW 7	The Contractor shall complete the Workflow Service as a standard service.	What Workflow service is this referring to?	The workflow service is described in the SRS Section 3.1
CR #16	IFB-CO-15079-IAS_Final_SOW.docx SOW 25	The Contractor shall meet or "exceed" the dates mentioned in the table below. (Note: "Exceed" is to be understood as a situation where the Contractor has delivered earlier than the dates (i.e., EDC + 'x' months) mentioned in the schedule and the Purchaser has accepted the milestone accordingly).	The schedule in the table required the update of approx. 26 sites in 4 months. Is this really expected/realistic?	This is correct. The solution is centralized and the expectation is the remaining sites are implemented according to the schedule provided.
CR #17	IFB-CO-15079-IAS_Final_SOW.docx SOW 30	The Contractor shall execute all project management activities (see Error! Reference source not found.) due up to this milestone, and shall achieve Purchaser approval of all associated deliverables (in particular: PMP, QAP, CMP, Risk Log, Issue Log).	Please provide the reference here.	Yes, Fixed in Amendment 1
CR #18	IFB-CO-15079-IAS_Final_SOW.docx SOW 45	The Contractor shall hold a pilot release meeting with the purchaser and shall support the Purchaser in completion and approval by the Security Accreditation Authority (SAA) of the Security Accreditation Documentation (see 12.2), handle any change in system design and documentation required by the SAA to satisfy the security requirements. (SECTION 4 Error! Not a valid bookmark self-reference.)	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1
CR #19	IFB-CO-15079-IAS_Final_SOW.docx SOW 47	Contractor shall execute all activities required to have all IKM Tools software components on the Approved Field Product List (AFPL). (SECTION 4 Error! Not a valid bookmark self-reference.)	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #20	IFB-CO-15079-IAS_Final_SOW.docx SOW 48	The Contractor shall support the deployment of the IKM tools to the remaining sites to PSA (Provisional Site Acceptance) (SECTION 4 Error! Reference source not found.)	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1
CR #21	IFB-CO-15079-IAS_Final_SOW.docx SOW 50	The Contractor shall support (SECTION 4 Error! Reference source not found.). The delivery of the IKM tools capability in the locations identified in ANNEX D is subject to Purchaser acceptance and approval.	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1
CR #22	IFB-CO-15079-IAS_Final_SOW.docx SOW 80	The Contractor shall meet the Test requirements listed in Error! Reference source not found., namely: a. Functional test. b. Non-Functional test (Stress load and Performance tests). c. Migration test. d. SIT. e. UAT. f. Fallowover. g. Disaster Recovery. h. Security test. i. Operational System Acceptance.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #23	IFB-CO-15079-IAS_Final_SOW.docx SOW 85	The Contractor shall ensure that IKM Tools components are fully compatible with ITM IaaS network architecture.	How can this be verified? Is this requirement only pertaining to ensuring the solutions function on ITM compatible hardware? Or are there any expected interactions/interfaces with the solution directly? Which documents should be used to confirm / verify this?	Yes, Joining instructions have been provided for ITM.
CR #24	IFB-CO-15079-IAS_Final_SOW.docx SOW 86	The Contractor shall follow the security requirements stated in Error! Reference source not found.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #25	IFB-CO-15079-IAS_Final_SOW.docx SOW 100	The Contractor shall deliver the Training section of the Integrated Logistics Support Plan (ILSP) for the Pilot sites for approval by the Purchaser, as defined in section Training Error! Reference source not found.	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1

CR #26	IFB-CO-15079-IAS_Final_SOW.docx SOW 103	Any release shall incorporate user feedback from the Pilot Release and integration with other systems/projects.	Where does the Purchaser draw the line regard-ing changes that the users might request as part of User Feedback	UAT testing will be based on Operation Acceptance Criteria. If the test cases are well defined, there will be little extra user feedback
CR #27	IFB-CO-15079-IAS_Final_SOW.docx SOW 107	The Contractor shall incorporate in the system design lessons learned from the pilot release, in agreement with the Purchaser.	Does this mean that the system design should be changed following the pilot release? This would normally be a clear Change Request and need to be managed (and funded) formally, assuming the changes were not defect corrections.	If required. The design should be based on the scope of the project. These are not new features, rather, requirements that are part of the scope as part of a normal project lifecycle. Each CR needs to be backed up by a requirement.
CR #28	IFB-CO-15079-IAS_Final_SOW.docx SOW 112	The Contractor shall deliver the updated Training Plan section of the Integrated Logistics Support Plan (ILSP) for the PSA sites (ANNEX D) for approval by Purchaser, as defined in Error! Reference source not found.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #29	IFB-CO-15079-IAS_Final_SOW.docx SOW 123	The Contractor shall deliver the Final Release, which shall incorporate all lessons learned from previous releases.	What does "incorporate" mean? Where does the Purchaser draw the line between this require-ment and a formal Change Request?	Incorporate means to Include all Lessons learned. Each CR needs to be backed up by a requirement. Not asking for something extra, rather, a completion of a requirement that may have been omitted or defect
CR #30	IFB-CO-15079-IAS_Final_SOW.docx SOW 181	The Contractor shall configure all IKM Tools Platform Services equipment (software, IaaS), in accordance with Error! Reference source not found., and the CDR.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #31	IFB-CO-15079-IAS_Final_SOW.docx SOW 210	This section outlines the System Engineering, Integra-tion, Tests, Sites Surveys and implementation of the infrastructure, and IKM Tools (NIP, TT+ and EDMS). The Contractor shall be responsible for the implementation of the overall design and integration with other services necessary to allow the IKM Tool Applications to function, obtaining security accreditation through-out the Contract period of performance. When need-ed, the Contractor is required to provide reasonable effort for the integration with other services neces-sary to allow the IKM tools applications to function.	What does "reasonable effort" mean and how is this determined? i.e. number of hours required to integrate?	Ok - removed "reasonable effort"
CR #32	IFB-CO-15079-IAS_Final_SOW.docx SOW 212	The Contractor shall integrate all necessary compo-nents to establish the Service Baseline, and plan and execute a series of tests to confirm that this baseline meets its requirements, in accordance with Error! Reference source not found.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #33	IFB-CO-15079-IAS_Final_SOW.docx SOW 213	The Contractor SDS shall describe the systems to a level of detail that is sufficient for the Purchaser to be able to ensure that the requirements in the SRS and the security require-ments (see Error! Reference source not found B) are implemented.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #34	IFB-CO-15079-IAS_Final_SOW.docx SOW 235	The Contractor shall perform site configuration and activation, which comprises the following activities: a. Perform site configuration of any Hosting Platform Services elements (Hardware, Software), including establishment of network connectivity between all required components, in accordance with Error! Reference source not found.). b. Perform site activation. c. Deliver all documentation associated to site config-uration and activation.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #35	IFB-CO-15079-IAS_Final_SOW.docx SOW 287	Three (3) main types of deliverables and activities relate the security accreditation process: a. Security Working Group (SWG) – see Error! Refer-ence source not found. b. Documentation c. Software approval – see 12.2	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #36	IFB-CO-15079-IAS_Final_SOW.docx SOW 308	The Purchaser reserves the right to perform user produced test scenarios during this test. The Contractor shall be responsible for ensuring the IAS components successfully pass these test scenarios.	Is it possible that the tests will include features not foreseen / currently in the system (or con-tract)? In such cases, the tests would fail and the Contractor would possibly be required to fulfil the requirement, which would be a change in the requirements agreed upon until that point.	No - all has to be within the scope defined in the project
CR #37	IFB-CO-15079-IAS_Final_SOW.docx SOW 338	The Contractor shall ensure the Maintenance and Administration manual includes an annex with troubleshooting information that provides breakdowns of actions to be performed to solve a full range of (potential) prob-lems or provide workarounds.	"Full range" is subjective and open ended. Upon which basis will the Purchaser accept this docu-ment? As written, the Purchase could theoreti-cally never accept the document and leave it open for constant update "for ever" (exaggerat-ed to make the point clearer).	For more clarity, re-worded in Amendment 1: "The Contractor shall ensure the Maintenance and Administration manual includes an annex with troubleshooting information that provides breakdowns of actions to be performed to solve assessed (potential) problems or provide workarounds. Assessments shall be based on Analyses (e.g. Failure Modes Effects Analysis (FMEA), Maintenance Task Analysis (MTA)) including typical known issues."
CR #38	IFB-CO-15079-IAS_Final_SOW.docx SOW 342	The Contractor shall provide training for all system administrators, functional administrators and users of the new system through a combination of self-study aids, including System User and Administrative Manu-als (hard copy and interactive electronic), residential, instructor-led training, on-the-job (OTJ) training, Computer-Based Training (CBT) and eLearning Train-ing Materials, in accordance with the NATO B-S-SDR D57-7, September 2015, and AIS specific training re-quirements. The training shall enable personnel ap-pointed by the Purchaser to safely test, operate/use, troubleshoot, restore and maintain all HW and SW of the IAS System procured through this contract.	How does the Purchaser interpret "on the job" training? The Contractor should accompany the staff during daily work? For how long? Or only for a few hours during the training period?	For more clarity, re-worded in Amendment 1: OTJ training as stated in SOW 344 aims to be a hands on training in "normal working situations". In accordance with the Milestones (SOW Table 6) initial training shall be conducted and finalized before Site Acceptance. To provide more clarity, "OTJ" will be re-worded to "practical hands-on training" in the training section of the Amendment of the SOW.
CR #39	IFB-CO-15079-IAS_Final_SOW.docx SOW 344	The purpose of the On-the-Job Training (OTJ) is to provide hands-on training to the operational users in a normal working situation. The OTJ shall include help-ing the operational user to perform initial operational tasks.	What are the expectations of time regarding the "OTJ"? Also: is OTJ only foreseen for the System Administrators in Mons/Lago Patria?	For more clarity, re-worded in Amendment 1: OTJ training as stated in SOW 344 aims to be a hands on training in "normal working situations". In accordance with the Milestones (SOW Table 6) initial training shall be conducted and finalized before Site Acceptance. To provide more clarity, "OTJ" will be re-worded to "practical hands-on training" in the training section of the Amendment of the SOW. New wording for SOW 344: "The Contractor shall provide practical hands-on training to the operational users similar to normal working situations. The hands-on training shall enable the operational user to perform typical operational tasks." Practical hands-on training shall apply to Operational users (SOW 344) as well as to System Administrators (SOW 345). System Administrator training is foreseen to be primarily performed at Mons and possibly one other location.
CR #40	IFB-CO-15079-IAS_Final_SOW.docx SOW 347	As part of the system implementation, the Contractor shall provide on-site training to all support staff design-nated by the Purchaser and on all tasks required to operate, maintain, administrate, and recover.	Should local staff (at all commands) be required to receive training for operate, maintain and recover? If the systems are managed centrally, is assumed that the local staff will not have access needed for these activities.	Correct
CR #41	IFB-CO-15079-IAS_Final_SOW.docx SOW 350	The Contractor shall provide all other facilities, ser-vices and equipment (including servers and work-stations for students and teachers, network equip-ment, all required SW, etc...) necessary to carry out the On-Site Training activities.	What does facilities mean in this context? It assumed that training will take place at NATO sites. Also: Will the Contractor be allowed to bring external training equipment to ALL NATO sites? If not, what alternatives are acceptable?	Training will take place at NATO sites. Yes, the contractor will be allowed to bring external training equipment to the nato sites.
CR #42	IFB-CO-15079-IAS_Final_SOW.docx SOW 353	The Contractor shall conduct a Training Needs Analy-sis (TNA) in accordance with the [BISC D-075-007, 2015]. The TNA shall include (as a minimum): a. Target Audience Analysis. b. Performance Gap Analysis. c. Difficulty, Importance and Frequency (DIF) Analysis. d. Training Delivery Options Analysis. e. The Training Needs Analysis shall consider all as-signed staff roles involved in IAS System operation, administration, maintenance and support at all levels.	Please provide the reference here to avoid mis-understandings.	Yes, Fixed in Amendment 1
CR #43	IFB-CO-15079-IAS_Final_SOW.docx SOW 403	The System Inventory is site-specific and shall include, in separate chapters, all items furnished under this Contract, as follows: a. All main equipment – i.e. all CIS items, both COTS and Developed, down to replaceable item level, hier-archically listed conform configuration item decom-position, including groups and assemblies; all installed hardware, such as equipment racks; all LRU intercon-necting equipment when they are special-to-type (e.g. special-to-type cables); b. All ancillary equipment – i.e. all secondary items not essential to the functioning of the system, but deemed essential to the operation of the system, such as standard cables, tool box, but not the tools inside the tool box etc; c. All Purchaser and Contractor provided software in form of a Software Distribution List (SWDL) as de-tailed 13.4.2 Software delivery; d. All support equipment – i.e. all tools, test equip-ment, etc. (where applicable); e. All Purchaser Fur-nished Equipment (PFE); (where applicable); f. All documentation, such as manuals, handbooks and drawings; g. All training documentation Location Reference Indicator including Building, Room, Rack number, Rack location.	This requirement is assumed to only apply to the sites where hardware will be delivered (i.e. Mons and Lago Patria). Is this correct?	Yes, that is correct
CR #44	IFB-CO-15079-IAS_Final_SOW.docx SOW 408	The Contractor shall deliver a CIS Data Sheet (CIDS) also known as Material Data Sheet (MDS). The Data Sheet is site and delivery specific and shall be submit-ted at least ten (10) working days before the delivery of the equipment. A template can be obtained from the Purchaser.	This requirement is assumed to only apply to the sites where hardware will be delivered (i.e. Mons and Lago Patria). Is this correct?	Yes, this is correct

CR #45	IFB-CO-15079-IAS_Final_SOW.docx SOW 411	The Contractor shall be responsible for all handling and storage of equipment, packages, boxes and containers during the project.	The Contractor assumes this requirement applies to hardware not yet delivered to NATO. Once the hardware is reached NATO, the Contractor assumes that NATO will take responsibility as the Contractor will only have limited access (if at all) to the hardware afterwards. Is this correct?	Yes, this is correct
CR #46	IFB-CO-15079-IAS_Final_SOW.docx SOW 412	The Contractor shall also be responsible for organising and operating any handling equipment and storage facilities required.	This requirement is not clear. Does this apply to after the hardware has been delivered to NATO? The Contractor assumes this can only apply to handling of the hardware before it reaches NATO. Once the hardware reaches NATO sites, the Contractor assumes they will no longer have direct access to hardware storage areas or be allowed to operate handling equipment (i.e. a forklift) on NATO premises.	Correct, until acceptance of the delivery by NATO.
CR #47	IFB-CO-15079-IAS_Final_SOW.docx SOW 489	The Contractor SHALL execute the following tasks related to the operation of the IKM Tools: a. Application monitoring i. Monitor Application Performance and Availability. ii. Analyse Performance and Availability data and historical metrics to effectively plan for growth needs; plan upgrades, migrations, optimizations and new implementations; identify and resolve efficiency issues, and improve overall functionality. iii. Raise Incidents/Problems to track the resolution of Performance and Availability issues. iv. Monitoring of the correct replication of the Ap-plication between remote sites. v. Raise Incidents to track the resolution of Application replication issues. vi. Monitoring and management of events (alerts, warnings, etc.). vii. Log management i. Monitor Application specific logs. ii. Monitor Application access Logs. iii. Periodic archiving of Application logs. c. Backup & Restore i. Establish Backup schedules. ii. Execute backups. iii. Execute restores. iv. Check the correctness of the restores.	Many of the tasks here are outside of the application management tasks as they exist today. All back-end maintenance tasks are managed in another area (i.e. in the bunker). Is the Contractor allowed and expected to provide staff to augment the bunker staff to support these activities? Full time?	No, the Contractor is not expected to provide staff to augment the bunker staff. The Contractor is expected to execute the monitoring tasks from building 302, using the monitoring data (performance reports, availability reports, replication logs, alerts, etc) made available by the NCI Agency. For what regards backups, the Contractor will be responsible only for the eventual backups/restores to be initiated at the Application layer, if the Application-level backup will be required by the new design.
CR #48	IFB-CO-15079-IAS_Final_SOW.docx SOW 491	The Contractor shall conduct Business Continuity testing and Disaster Recovery testing. This will be conducted regularly to keep up preparedness and at least after every major configuration change to ensure Business Continuity and DR plans work and are sufficient for service restoration in agreement with the Purchaser.	How does the Purchase envision this? Will a separate environment be provided in the ON and PBN for this purpose?	Yes - there will be a separate test environment for ON and PBN where this should take place
CR #49	IFB-CO-15079-IAS_Final_SOW.docx SOW 494	Contractor's onsite manpower shall be located in MONS for Level 3 operation and maintenance tasks, and shall travel to other NATO locations as required. Additionally, the Contractor SHALL supplement maintenance support with off-site staff as required, as approved by the Purchaser.	Will costs associated with travel to other NATO sites be reimbursed or is this expected to be included in the costs? How often can this happen? More details are needed to provide a fair estimate.	The cost will be re-imbursed.
CR #50	IFB-CO-15079-IAS_Final_SOW.docx SOW 498	When on-site in Mons, the Contractor's on-site per-sonnel shall normally support the Purchaser during the Purchaser's working hours, Monday to Friday, 8h30 to 17h30 (CET), excluding Purchaser's holidays. In exceptional cases, to be agreed by the Contractor, the on-site Contractor personnel shall support special operational and business needs outside Purchaser's working hours without additional cost to the Purchaser.	Does this include work on weekends? How often could this occur? As this will create significant costs, more details are needed in order to provide a fair estimate of the costs.	This is during normal working hours. SOW 500 details outside working hours
CR #51	IFB-CO-15079-IAS_Final_SOW.docx SOW 499	In order to support the Purchaser's customers in different time zones from Mons, a reduced number of Contractor's manpower (at least 1 FTE) shall cover the following hours: a. Monday to Friday, 7h00 to 17h00 (UTC -05:00) b. Monday to Friday, 8h00 to 16h00 (UTC) c. Monday to Friday, 7h30 to 16h00 (UTC +01:00)	Is the bidder's assumption correct, that the given time zones are for the winter times? Shall for summer times the corresponding times for the given time zones apply? In order to provide support for the US east coast (UTC - 05:00) the corresponding time in Mons would be from 13h00 to 23h00. Is access to SHAPE granted in the late evening and night? Are the needed facilities available in this time frame? Can support in the time from 17h00 to 23h00 hours be given from a bidder's own service desk?	1. Is the bidder's assumption correct, that the given time zones are for the winter times? Shall for summer times the corresponding times for the given time zones apply? → The time zones are valid both for winter and summer time. 2. In order to provide support for the US east coast (UTC - 05:00) the corresponding time in Mons would be from 13h00 to 23h00. Is access to SHAPE granted in the late evening and night? Are the needed facilities available in this time frame? → Yes, the needed facilities are available in this time frame. 3. Can support in the time from 17h00 to 23h00 hours be given from a bidder's own service desk? → No, given the fact that the support team needs to access the ON in order to troubleshoot any incident and to update the NCIA ITSM tool on the ON, support cannot be given from a bidder's own service desk.
CR #52	IFB-CO-15079-IAS_Final_SOW.docx SOW 521	All the data used for the CLS Performance Report shall be extracted by the Contractor (manually or automatically) from the Purchaser's Trouble Ticketing system.	Does this mean that most reporting is only possible in the ON as the data cannot always be taken outside of that network? Also: there is no export function available on the ticketing sys-tem: will this be made available? Or is this a manual copy & paste activity requiring on-site work?	1. Does this mean that most reporting is only possible in the ON as the data cannot always be taken outside of that network? → Yes, most reporting will be possible only in the ON 2. Also: there is no export function available on the ticketing sys-tem: will this be made available? Or is this a manual copy & paste activity requiring on-site work? Yes, Fixed in Amendment 1
CR #53	IFB-CO-15079-IAS_Final_SOW.docx SOW 660	The Contractor shall ensure that the PMP comprises of the following sections unless otherwise agreed to by the purchaser: a. An 'Organisation' section describing the Contractor's organisation for this project according to the requirements. This section shall include an organisational chart showing the members of the Contractor's Project Team (including the members of the Contractor PMO) and showing their respective responsibilities and authority. This section should also include proposed Project Communication Plan. b. A 'Project Planning' section describing the Contractor's processes supporting the development and maintenance of the PBS, and PMS according to the requirements. c. A 'Risk management' section describing the Contractor's processes supporting Risk Management by the Contractor. d. A 'System Engineering' section describing the Contractor's approach to these activities according to the requirements in section 11.2. e. A 'System Implementation' section describing the Contractor's approach to these activities according to the requirements in section 3.7. f. An 'Operation and Maintenance' section describing the Contractor's approach to these activities according to the requirements in Error! Reference source not found.. g. A 'Testing' section describing the Contractor's approach to these activities according to the requirements in Error! Reference source not found..	Please provide the reference here to avoid misunderstandings.	
CR #54	IFB-CO-15079-IAS_Final_BiddingInstructions.pdf	3.6 Technical Proposal	The chapter is empty. Please provide the missing content for the bidders to be able to deliver the technical proposal in expected format.	Yes, Fixed in Amendment 1
CR #55	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-10	The IKM Tools shall integrate with the 'NIP Core' application layer consisting of a set of templates, services, metadata, content types and COTS. Layer 2 for automatic metadata tagging and Sprague for cross-site look up.	Is the assumption correct that the licenses are provided by the Purchaser as PFE?	Yes - these will be provided as PFE
CR #56	IFB-CO-15079-IAS_Final_SOW.docx SOW 100	The Contractor shall deliver the Training section of the Integrated Logistics Support Plan (ILSP) for the Pilot sites for approval by the Purchaser, as defined in section Training Error! Reference source not found.	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1
CR #57	IFB-CO-15079-IAS_Final_SOW.docx SOW 112	The Contractor shall deliver the updated Training Plan section of the Integrated Logistics Support Plan (ILSP) for the PSA sites (ANNEX D) for approval by Purchaser, as defined in Error! Reference source not found.	Please provide the reference here to avoid misunderstandings.	Yes, Fixed in Amendment 1
CR #58		The term "IKM Tools" is used throughout the bidding documents but used in different contexts and associated with varying technologies.	Please specify the delivery item(s) of the term IKM Tools (e.g. only NIP, EDMS, TT+) and the distinction to platform and other infrastructure components.	IKM tools are these 3 application. Throughout the requirements, it also considers the added capabilities (Workspace, workflow, archiving and distribution).
CR #59	IFB-CO-15079-IAS_Final_SOW.docx SOW 11	The Contractor shall deploy the IAS into the sites listed at ANNEX D, located in the following environments a. The Operational Network (ON) b. The protected Business Network (PBN) c. The Mission Networks at SHAPE (Mons, Belgium) and Naples, Italy d. The Training Networks at JWC and JFTC.	Shall the contractor offer dedicated hardware for all mentioned environments?	Yes
CR #60	IFB-CO-15079-IAS_Final_SOW.docx SOW 11	The Contractor shall deploy the IAS into the sites listed at ANNEX D, located in the following environments a. The Operational Network (ON) b. The protected Business Network (PBN) c. The Mission Networks at SHAPE (Mons, Belgium) and Naples, Italy d. The Training Networks at JWC and JFTC.	Are all mentioned environments part of the ITM and provide the same set of ITM services and sub services?	Yes, ON and PBN are part of ITM networks. The training networks JWC and JFTC also but delivered in wave 2. The Mission networks not.
CR #61	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-16	The IKM Tools shall upgrade the NIP application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed).	We kindly request the complete list mentioned in this chapter.	Complete list is located in SOW Annex D. Text amended in SRS.
CR #62	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-17	The IKM Tools shall upgrade the NIP application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed).	We kindly request the complete list mentioned in this chapter.	Complete list is located in SOW Annex D. Text amended in SRS.
CR #63	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-18	The IKM Tools shall upgrade the NIP application, content and dependant services into the provided ITM Share Point infrastructure in ON, PBN and Standalone networks (complete list needed).	We kindly request the complete list mentioned in this chapter.	Complete list is located in SOW Annex D. Text amended in SRS.

CR #64	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-53	The IKM Tools shall leverage the current Microsoft Power BI and KNIME technologies to provide the analytic services	Are Power BI and KNIME provided as PFE existing services of the ITM platform and only connected via API, or is the deployment and deriving concept part of the Contractors delivery for this project?	They will be provided as PFE, aka a service that the IKM Tools can call and consumer from. They'll be available in ITM and the Contractor doesn't have to deploy them.
CR #65	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-61	In this IAS Step 2 the Contractor shall upgrade to the ITM Share Point platform. By upgrading the IKM Tools, deploying them into the ITM Share Point platform along with the respective data, services and into the target security domains. NS for the IKM Tools in ON, NR for the IKM Tools in PBN.	Is the assumption correct that the SharePoint platform hosting the IKM tools is provided by ITM? If yes, to which networks ON/PBN is this platform deployed to?	ITM will provide the Share Point platform but the current IKM Tools won't be there deployed, it is the Contractor to upgrade and deploy them. The current IKM tools will be hosted in ITM in SPS2013 (stand alone) but not in the ITM provided Share Point. The upgrade and deployment is for ON and PBN.
CR #66	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-62	The IKM Tools Workflow shall be available on the Operation Network (ON) and on the Protected Business Network (PBN). See SOW ANNEX D for the complete list of sites.	Please clarify: Is the Workflow application a separate application or part of the Tasker Tracker Plus workflow?	It is a separated Application, it's envisioned to be a workflow capability so that user can create workflows in various manners. The TT+ is a specific workflow application to execute a task with predefined participants and workflow flow.
CR #67	IFB-CO-15079-IAS_Final_SRS.docx SRS 2.2.2.1.9	Provide Information Exchange Services (2012/OIS03102 under CP 9C0150)	Has the project already delivered the cross domain services and border protection service? If available, please provide specification details regarding these services.	IEG C- NS-MS (~ON-MS) and IEG-D NS-NR (~ON-PBN) Available. Cross security labelling relying on XML Guard. HTTP/LDAP connectivity complying with STANAG 4774 and 4778.
CR #68	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-197	When an IP is to be exported it shall use a NATO Metadata Binding Service (NMBS) to attach the IP metadata to the exported file (bind). Conversely when an IKM Tools compatible IP is imported into the IKM Tools the Binding Service shall detach the IP metadata (unbind) and store it appropriately in the destination IKM Tools library. See Figure below.	Is the NATO Metadata Binding Service already available in all relevant networks (PBN, ON, Mission, Training...)? Please provide specification of the services involved.	The NATO Metadata Binding Service will not be available. Instead the Contractor shall implement the portions of this service needed to comply with the requirements. The SRS requirements 197 to 201 have been updated with additional references (to a NATO prototype that can be shared and standards).
CR #69	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-200	The IKM Tools shall use the NMBS to atomic sign the metadata with its related content (applicable to all IP) to guarantee the integrity of the tagged content (not to confuse with the integrity of the entire IP).	Please explain "to atomic sign".	That content signed with metadata is independent from other signature. That is invalidation of one doesn't invalidate the other, i.e: a Paragraph1 signed NATO RESTRICTED and paragraph 2 signed NATO UNCLASSIFIED, if Paragraph 1 is modified only that signature is invalidated not the second one
CR #70	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-210	The IKM Tools shall implement an archiving mechanism following the Industry accepted standard framework Open Archival Information System. Notably implement the two packages: - Submission Information Package (SIP): for the information products sent to the archive (compatible with NATO Docs system) - Dissemination Information Package (DIP): for the information sent to a user when requested.	Please provide specification details of the NATO Docs Sys-tem, SIP, and DIP.	See ISO 14721:2012 Standard https://www.iso.org/standard/57284.html https://en.wikipedia.org/wiki/Open_Archival_Information_System NATODocs is a custom version of Documentum (OpenText). It is managed in NS by NATO Archives: http://archives.nato.int , and it expects documents submitted in OPC format.
CR #71	IFB-CO-15079-IAS_Final_SRS.docx IKM-SRS-71	The IKM Tools shall support the following workflows patterns: - Digitalized Process: workflows defined from external analogue source (i.e.: paper) - Intelligence Business Operations (IBO): workflows based on analytics (part of IKM Tools) and decision management technologies integration that produces a transaction.	What is the objective of this requirement and what is the required level of integration with the analytics component in the IBO scenario?	Intelligent Business Operations (IBO) as a style of work characterized by operational intelligence in real-time that links quick business analyses with a business's traditional day-to-day activities. Meaning that analysis reports coming from BI (i.e as Web Part) can be dynamically drill in and will depict real (updated) data, rather than a report batch produced in advanced.
CR #72	IFB-CO-15079-IAS Book II – Part IV SOW Annex A SRS IKM-SRS-266	The Contractor shall deliver, at least, the same functionality as the current IKM Tools.	Is it to assume that the purchaser provides all documentation of the current application version including installation media, system design, architecture and source code of the existing applications (NIPEDMS/TT Plus) to the contractor after contract award?	This is correct. We have also shared the current state and all documentation via Hard Drive
CR #73	1C_IFB-CO-15079-IAS - Book 1 Annex A Bidding Sheets v4_FINAL.xlsx TAB Labour and Options and TAB CLIN Summary CLIN 5.3.9 Operational Acceptance Criteria	CLIN 5.3.9 Operational Acceptance Criteria shall be priced by the bidder.	However the referenced SOW §7.7 does not exist in the provided statement of work. Please clarify if the bidder needs to price CLIN 5.3.9 and if yes, please provide the missing section in the SOW.	SOW section 7.5
CR #74	NIP Source Code		The NIP Source Code is missing on the Hard Drive	The NIP source code can be found in the internet portal for this IFB
CR #75	VM Passwords		What is the password to access VMs on Hard Drive	See attached "P95_Step2_IFB_VM_Pass"
CR #76	SRS Amendment		Please clarify SRS-IKM	Added the section 3.1.7 Artificial Intelligence (AI)
CR #77	6_IFB-CO-15079 - Book 2 - Part 4 - SoW (Annex A-SRS) v.3	The changes made to chapter "3.4.1.1 Distribution and Archiving" from CR# 68 were "rolled back" and no longer reflect the changes from the previous version	We assume that this happened by accident and that the updated chapter 3.4.1.1 as provided in AMDZ and defined by CR#68 are still valid und not superseded.	That is correct, this is an error and the changes from CR#68 are still valid and not superseded. An updated SRS (6_IFB-CO-15079 - Book 2 - Part 4 - SoW (Annex A-SRS) v.3.1) has fixed this oversight.