



INTERNATIONAL MILITARY STAFF
ETAT-MAJOR MILITAIRE INTERNATIONAL



15 October 2012

IMSTAM(FC)-0072-2012

To : See Distribution List

From : Purchasing & Contracting Officer

Subject : **CALL FOR COMPETITIVE BIDDING (CFB) IMS 2012-006, APP-15
PROJECT PHASE 2 (NATO INFORMATION EXCHANGE
REQUIREMENTS SPECIFICATION PROCESS**

1. This call for competitive bidding aims to obtain tenders to conduct a Feasibility Study providing Technical Support within Data Management capability to define data products that are coherent and efficient-to-use for the APP-15 data standards development process.
2. We believe you may be interested in responding to the enclosed call for bidding.
3. Bids must comply with the General Contract Conditions and the Statement of Work, but additional options suggested by Contractors will also be considered.
4. Your attention is drawn to the closing date/time for bids :

12 November 2012 – 12.00 Hr (Brussels time).

5. The bids should be addressed to:

Ernesto SCOGLIONERO
Purchasing & Contracting Assistant (H-118)
North Atlantic Treaty Organisation
International Military Staff
Boulevard Leopold III
1110 Brussels, Belgium
Tel : +32 (0)2 707 5739
Fax : +32(0)2 707 5884
✉ : sa.p&c@hq.nato.int or scoglionero.ernesto@hq.nato.int

6. Questions relating to the General Contract Conditions or the Technical Specifications will be permitted. The point of contact is as follow:

Ernesto SCOGLIONERO
Purchasing & Contracting Assistant (H-118)
North Atlantic Treaty Organisation
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Boulevard Leopold III
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7. All documents supplied by NATO in relation to this Call for Competitive Bidding are for use in bid preparation only within the bidding companies.
8. Prices for any options offered by the Bidder shall be quoted separately.



Mr. Ernesto SCOGLIONERO
Purchasing & Contracting Assistant
International Military Staff

Enclosures

- I. General Contract Conditions
- II. Technical Specifications/Statement of Work
- III. Extract from Staff Paper/Food For Thought Paper on APP-15

Copy To : MA DG IMS, NHQC3S (Mr. Elliot,),RECORDS, FC IMS

Action Officer Mr. E.SCOGLIONERO, P&C Assistant (5341), Mr. I.DAVIES, Principal Administrator (Finance) to FC IMS (4593)

GENERAL CONTRACT CONDITIONS

APP-15 PROJECT PHASE 2 (NATO INFORMATION EXCHANGE REQUIREMENTS SPECIFICATION PROCESS)

1. GENERAL CONTRACT SPECIFICATIONS

- a. The Financial Controller of the International Military Staff (IMS), North Atlantic Treaty Organization (NATO), is responsible for applying the bidding procedure to meet the requirements of the Organization.
- b. Implementation of this procedure does not entail any obligation to award a contract. NATO may either decide not to let the contract or set the procedure in motion again, if necessary in a different form.
- c. When the contract covers several parts, the competent authority reserves the right to allocate some of them only and it may even decide that the other parts will be covered by one or more contracts, if necessary under a different procedure.
- d. Calls for bids may be altered or cancelled in whole or in part, before the closing date for bids, in which case the bidders are informed in writing.
- e. During the life of this contract, the Financial Controller IMS and his/her Purchasing & Contracting Officer (P&C Officer) will, in its relation with the contractor, represent NATO. The contractor shall formally direct all enquiries and/or correspondence relating to the contract to the P&C Officer. Any modifications to the object or any other aspect of the present contract will have to be authorised by the above authorities

2. BIDS

- a. Bids, drafted in English, must be received in duplicate in a sealed envelope before the closing date. This envelope should contain two sealed envelopes. The first envelope should contain the technical proposal, which will be evaluated by a technical assessment team. This envelope should be clearly marked "Statement of Work Proposal CFB IMS 2012-006" and should not contain any financial information. The second envelope should contain the financial proposal and be clearly marked "Financial Proposal CFB IMS 2012-006". The bids must be provided under tamper-proof/write protected CD format. Every CD will be marked with a unique and indelible number/name/description.
- b. Up to the closing date, bidders may modify or cancel their offers in whole or in part.
- c. If a bid is made for only part of the requirements, this has to be identified clearly in the proposal.
- d. (Potential) bidders should register their interest in bidding by sending a confirmatory email to: sa.p&c@hq.nato.int. The P&C Officer will ensure that registered bidders receive any further confirmation relevant to the Call for bids.

- e. (Potential) bidders must seek any needed clarification as soon as possible. Such requests for clarification must be submitted in writing (facsimile and e-mail are acceptable) and must be received no later than 14 days before the bid closing date. Questions and the answers on these questions shall be forwarded to all other registered bidders. Questions relating to the General Contract Conditions or the Technical Specifications will be permitted. The point of contact is as follows:

Ernesto SCOGLIONERO
North Atlantic Treaty Organization
International Military Staff
Purchasing & Contracting Officer (T6208)
Boulevard Leopold III
1110 Brussels, Belgium

☎ +32(0)2 707 5739

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✉ sa.p&c@hq.nato.int or scoglionero.ernesto@hq.nato.int

- f. Bid prices must be fixed and firm and valid for 60 days from the date of the bid, or until 31 December 2012, whichever is longer.
- g. Bidders may take alternative proposals on a separate CD/file, which must be clearly marked "ALTERNATIVE".
- h. Bids should contain the eventual costs for delivery at NATO's HQ. These costs will be mentioned separately in the financial proposal.
- i. Bids should mention Recycling/Recupel costs (if needed).
- j. Bids must contain a delivery schedule.
- k. Requests for extensions of the bid closing date must reach the P&C Officer not later than 14 days prior to the bid closing date. That request should be justified very well. The P&C Officer decides either to grant or decline the extension.

3. AWARDS

- a. The Awards Committee meets in private.
- b. The Awards Committee may accept or reject bids in whole or in part, as stated above.
- c. The Awards Committee selects the valid bid which it considers the most advantageous, taking into account the quotation, the cost of utilization, the technical characteristics, the reliability of supplies, the professional and financial credibility of each bidder, the time schedule, any other relevant considerations, together with any "SUGGESTIONS" made in the bid, unless otherwise stipulated.

- d. Bidders will be informed in writing whether their offer has been accepted or rejected. No reasons need be given.

4. SCOPE OF THE CONTRACT

- a. The Contractor shall provide the required goods and services as described in Enclosure II.
- b. The specifications described in Enclosure II are the minimum requirements.
- c. The contractor shall provide the goods and services in the negotiated timeline. Any major departure from this timeline can lead to termination of the contract. A period of one third of the negotiated delivery period will be considered as a major departure.
- d. Performance of the work covered by this contract shall be under the overall direction of the project manager, NATO Headquarters C3 Staff (NHQC3S).
- e. Any software must be implemented as a NATO-network homed cloud-based solution, accessible through an internet browser, via a secure connection, with no vendor software installation required at the client.
- f. The contractor will provide a warranty valid for one year for the material produced under this agreement and will correct this training material, without charge, should any significant error occur during this period.

5. PLACE AND HOURS OF WORK

- a. The work will be performed off site. The NATO project manager will be available by phone, email and by face-to-face contact including site visits to the contractor's premises, if and as required.
- b. The Contractor's personnel will be required to work with both military and civilian personnel and conform to the normal work schedule of NHQC3S. Normal duty hours will prevail but adjustments of work schedules may necessitate realignment from time to time.

6. PRICES, PAYMENTS AND INVOICES

- a. The contract will be fixed price for the services as specified and in accordance with the agreed terms and conditions as set forth herein. The price will include a one-year warranty.
- b. Payment for the services performed by the Contractor shall be paid within 30 days from receipt of acceptable invoices and in the currency set forth in the agreement.
- c. Under Articles 9 and 10 of the Ottawa agreement approved by the act of 1st February 1955: "Services supplied and goods delivered to the Organisation for its official use shall be exempt from Value Added Tax for each operation, the cost of which is 123.95 Euros or more, exclusive of VAT. Goods and services supplied in this way will be treated as exports".
- d. Invoices, in exemption of VAT, will be submitted in triple and give the following information: number of purchase order / agreement, description of supplies / services, sizes, quantities, prices, supplier's VAT identification and the appropriate VAT exemption statement i.e.:
 - for host nation firms (Belgium): « Article 42 §3, 3° code de la TVA et/ou exemption des droits d'accises / accises spéciaux DL 1/76.979 du 4/10/83 » ;
 - for firms from other EEC countries : "Article 15.10 from the EEC Council Directive 77/388/EEC";
 - for firms from non-EEC countries: "Articles 9 and 10 of the Ottawa agreement approved by the act of 1st of February 1955".
- e. For partial payments, the mention "Partial Payment n°...." will be added.
- f. The supplier's bank account number, bank name and address will be clearly indicated (including IBAN and BIC). Invoices shall be submitted to the North Atlantic Treaty Organization, NHQC3S – Fund Manager T-3008, Boulevard Leopold III- B-1110 Bruxelles – Belgium.
- g. The bidder acknowledges that the payment is exclusively due for services/goods rendered and received in accordance with the provisions of this contract and accepted as foreseen in this contract as performed to satisfaction of NATO, and will be adjusted accordingly.
- h. For payments in the Single Euro Payment Area (SEPA), the default approach for supplier payments in Euro will be "Straight Through Process" (STP). Consequently, both parties will share any banking costs related to the payment transaction.

7. CONTRACT PERIOD

- a. The contract will be effective from the day of the last signature by the contracting parties.

- b. The time/duration for the project is to be in accordance with agreed delivery schedule.
- c. The Contractor should propose a timetable for the execution of the project including if needed, the proposed number and location for face-to-face meetings for the NATO project manager to track project progress.

8. DELIVERABLES

- a. The prime purpose of this contract is to provide the deliverables as mentioned in the Statement of Work (see Enclosure II).
- b. The bidder acknowledges that any change on the scope of work of the present contract carried out by the contractor without previous authorization by the P&C Officer or Financial Controller will be considered to have been made at the contractor's own expense.

9. TERMINATION AND SUBSTITUTION RIGHTS

- a. IMS, by written notice of two (2) weeks, may terminate this contract, in whole or in part, when it is in the IMS's best interests. If the contract is so terminated, NATO shall be liable only for payment in accordance with Article 6, Prices, Payments and Invoices, of this contract for work performed prior to the effective date of termination.
- b. IMS may, for just cause, require the Contractor to remove, without any additional cost to NATO, one or more of his employees provided that notice in written form is given to the Contractor.
- c. Additions, withdrawals or changes made by the Contractor in personnel assigned to this contract shall not be permitted without prior agreement with IMS in accordance with the terms and conditions of Article 10, Key Personnel, of this contract.

10. KEY PERSONNEL

The personnel provided under this contract are considered to be essential to the work being performed hereunder. If, nevertheless, the Contractor wishes to replace personnel, the Contractor shall notify the P&C Officer and shall submit justification of the impact on the programme. No substitution shall be made without the full knowledge and consent of the P&C Officer. In this case, the P&C Officer will prepare a contract modification to reflect the personnel changes. Notwithstanding the above, in the event of unforeseen personnel losses, the Contractor will be expected to take whatever measures are necessary to assure continued performance under this contract and any emergency replacement of key personnel will be submitted to the P&C Officer for consideration as soon as possible. All personnel must be citizens of NATO Member States.

11. RIGHTS IN TECHNICAL DATA

All technical data defined as all recorded information of a technical nature, specifications including computer software data, technical text, drawings, design type documents, instructions, illustrations, schematics or wiring diagrams, test procedures, training material and any other similar data resulting directly from the performance of this contract shall be the sole and exclusive property of NATO, and will be used by NATO nations for defence purpose.

12. COUNTRIES OF ORIGIN

The Contractor personnel must come from one of the NATO member countries, namely (in alphabetical order). ALBANIA, BELGIUM, BULGARIA, CANADA, CROATIA, CZECH REPUBLIC, DENMARK, ESTONIA, FRANCE, GERMANY, GREECE, HUNGARY, ICELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, NETHERLANDS, NORWAY, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, TURKEY, UNITED KINGDOM and UNITED STATES.

13. CONTRACTOR PERSONNEL

All documentation, discussions, correspondence and meetings will be in English. The Contractor shall employ only highly skilled labour with thorough experience of the work to be performed.

14. WORK AT NATO

- a. The Contractor personnel shall follow strictly the instructions from NATO officials regarding entrance to, and work at the site and stay within the indicated perimeter. Supervision will be carried out by NATO security officials.
- b. Contractor personnel who receive security passes must ensure that they are worn visibly when they are at the NATO HQ site and removed on leaving.
- c. All Contractor staff may be subjected to a personal search and a search of his/her vehicle, luggage and equipment while at the site.
- d. It is strictly unauthorised to bring weapons, explosives or, dangerous materials into NATO HQ without the proper licences and authorisations from the HQ Security Officer (HQSO).
- e. Portable computer equipment (laptops, PDAs, etc.) that is required for contractual work may be brought into the NATO HQ Administrative Zone, after they have undergone security checks.
- f. Portable computer equipment that is required for contractual work may be brought into restricted areas, but are subject to a written approval from the HQ Infosec Officer (HQIO). They may be authorized under the following conditions:
 - the equipment is absolutely necessary for the contractual work;
 - the equipment is not equipped with a camera;
 - all recording (e.g. voice) and transmission capabilities (e.g. Bluetooth, wireless technology e.g. IEEE 802.11x protocol, WiFi) have been switched off;
 - the equipment is not connected to NATO HQ networks;
 - the owner follows the instructions from HQ security officials; and
 - the equipment may be subjected to security inspections.

- g. Computer media (disks, CD/DVDs, USB sticks, etc.) used by contractor personnel at NATO HQ shall be clearly marked. Contractor personnel shall not use NATO HQ media unless this has been officially allowed in the contract.
- h. Contractor personnel are not allowed to access NATO HQ computer networks.
- i. Personal mobile phones and small personal radio/TV receivers and Walkmans/iPods are allowed into the Administrative Zone. They may not be used if they disturb in any way the activities of the NATO HQ Staff.
- j. All other electronic equipment e.g. cameras, recording and transmission equipment, etc. are allowed into the Administrative Zone only if they are needed for the contract, subject to the agreement of the NATO Office of Security (NOS).
- k. Cameras, recording devices (audio/video), mobile phones equipped with a camera, radio transmitters and laptops or PDAs fitted with cameras are not allowed inside restricted areas. Exceptions to this rule may be granted only by the NOS. In this circumstance the equipment will have to be cleared and officially marked.

15. ARBITRATION CLAUSE

- a. In the event of a dispute, the parties shall attempt to settle their differences in an amicable manner; however, notwithstanding the foregoing, the parties agree to institute arbitration proceedings in the manner provided below.
- b. The party instituting the arbitration proceedings shall advise the other party by registered letter, with official notice of delivery of his desire to have recourse to arbitration. Within a period of thirty days from the date of receipt of this letter, the parties shall jointly appoint an arbitrator. In the event of failure to appoint an arbitrator, the dispute or disputes shall be submitted to an Arbitration Tribunal consisting of three arbitrators, one being appointed by NATO, another by the other contracting party, and the third, who shall act as President of the Tribunal, by these two arbitrators. Should one of the parties fail to appoint an arbitrator during the fifteen days following the expiration of the first period of thirty days, or should the two arbitrators be unable to agree on the choice of the third member of the Arbitration Tribunal, within thirty days following the expiration of the said first period, the appointment shall be made, within twenty-one days, at the request of the party instituting the proceedings, by the Secretary General of the North Atlantic Treaty Organisation.
- c. Regardless of the procedure concerning the appointment of this Arbitration Tribunal, the third arbitrator will have to be of a nationality different from the nationality of the other two members of the Tribunal.
- d. Any arbitrator must be of the nationality of any one of the member states of NATO and shall be bound by the rules of security in force within NATO.
- e. Any person appearing before the Arbitration Tribunal in the capacity of an expert witness shall, if he is of the nationality of one of the member states of NATO, be bound by the rules of security in force within NATO; if he is of another

nationality, no NATO classified documents or information shall be communicated to him.

- f. An arbitrator who, for any reason whatsoever, ceases to act as an arbitrator, shall be replaced under the procedure laid down in paragraph 14.b above.
- g. The Arbitration Tribunal will take its decisions by a majority vote. It shall decide whether it will meet and, unless it decides otherwise, shall follow the arbitration procedures of the International Chamber of Commerce in force at the date of the signature of the present contract.
- h. The awards of the arbitrator or of the Arbitration Tribunal shall be final and there will be no right of appeal or recourse of any kind. These awards shall determine the apportionment of the arbitration expenses.

16. USE OF NATO FOR REASONS OF REFERENCE

- a. The use of the name of the NATO or of any NATO body by the supplier for reasons of reference must be authorized, on writing, by the Organization, after written request from the supplier. If any reference is made without preliminary NATO approval, immediate withdrawal should be done on a simple request by NATO.
- b. Such authorisation, to be granted, will be subject to the following conditions to be accepted, on writing, by the supplier.
 - The authorisation is limited to simply mentioning "NATO".
 - Before permission to use its name for reasons of reference is given, the Organization requires final editorial approval of any material to which it refers and in which it is mentioned.
 - The use of the NATO logo or any NATO body is excluded.
 - The supplier agrees to the immediate elimination of any reference to NATO if required by the Organization by certified mail. This decision, when taken, must be considered as a firm one and it will be not subject to any appeal. Nevertheless, the Organization will make sure that the supplier knows the reasons leading to that decision.
- c. Under no circumstance whatsoever permission to use NATO name for reasons of reference implies any kind of recommendation or endorsement of good/ services.

17. VALIDITY OF CONTRACT

The validity of the contract or purchase order is contingent on signature by the Financial Controller IMS and the P&C Officer IMS (if contract value is higher than €39,000) on behalf of NATO and by the appointed representative of the Contractor

**Statement of Work (SOW) for the APP-15 Project Phase 2
(NATO Information Exchange Requirements Specification Process)**

1. INTRODUCTION

- a. This Statement of Work (SOW) defines the tasks to be accomplished by the selected contractor. It will be used as the basis for the management of the contract.

2. BACKGROUND

- a. The requirement to transfer information between the NATO Command structure and the forces of NATO and non-NATO nations, and other organizations is essential to the effective conduct of NATO operations in the Comprehensive Approach (CA). One technology used for information exchange is character-oriented structured messages known as Message Text Formats (MTF) as defined in applicable NATO publications. The MTF standard is the military solution that is largely equivalent to EDIFACT (United Nations/Electronic Data Interchange for Administration, Commerce and Transport) standard.
- b. The definition of requirements for the exchange of information within NATO is expressed in the form of Information Exchange Requirements (IERs). An IER is a detailed operational expression of an information requirement, complemented by other operational constraints. IERs should be independent of technical solution but have sufficient detail to allow appropriate technical solution(s) to be identified and designed. The development of precise IERs is essential as validated IERs form the basis of NATO data and exchange standards that allow seamless interoperability. Solution independent IERs are to enable the development of multiple coherent information systems and exchange mechanisms.
- c. By contrast, an Information Exchange Specification (IES) is the comprehensive, detailed description of the translation of an IER into a specific technical solution, including appropriate justifications i.e. the basis for a data standard and exchange mechanism. The IES links operational requirements to technical data standards; as such the impact of technical changes on operational requirements and vice versa for a matured process must be traceable.
- d. The emerging NATO IER Specification Process as defined in APP-15 describes the development and specification process of NATO IERs that form the input for the development of appropriate technical solutions on the basis of the respective IESs. The MTF is one such information exchange solution.

e. Within the APP-15 Project of creating the IER Specification Process an incremental development has been chosen. It shall mitigate the risks and facilitate user involvement. The APP-15 Project is following an incremental approach in 3 phases:

- i. Phase 1 (COMPLETED): Development of a common IER process and templates for MTF related IERs. As a result of Phase 1 these are:
 - a. A single IER development process among all NSA operational communities.
 - b. A common IER format to be provided to the community responsible for IES development.

Refer to Annex2¹ for more information on the outcome of this phase.

- ii. Phase 2 (CURRENT PHASE): Consists of two stages (see Fig. 1)
 - a. Stage 1. Feasibility Study - conduct "Requirement Analysis" and "Prototype Toolset Application" utilizing MTF as the first "use case" for an IER development and technical solution generation process.
 - Stage 2. Establish an enterprise solution allowing scalable and expandable applicability for other information exchange mechanisms on the basis of the result from Stage 1.
- iii. Phase 3 (FUTURE PHASE): Involvement of other communities in the project, expanding to other data standards and information exchange technologies. Phase 2 will be repeated in Phase 3.

¹ Annex 2 is an extract from a staff food for thought paper on APP-15, created by the Information and Communities of Interest Branch of the NATO HQ C3 Staff; part of the NATO International Military Staff.

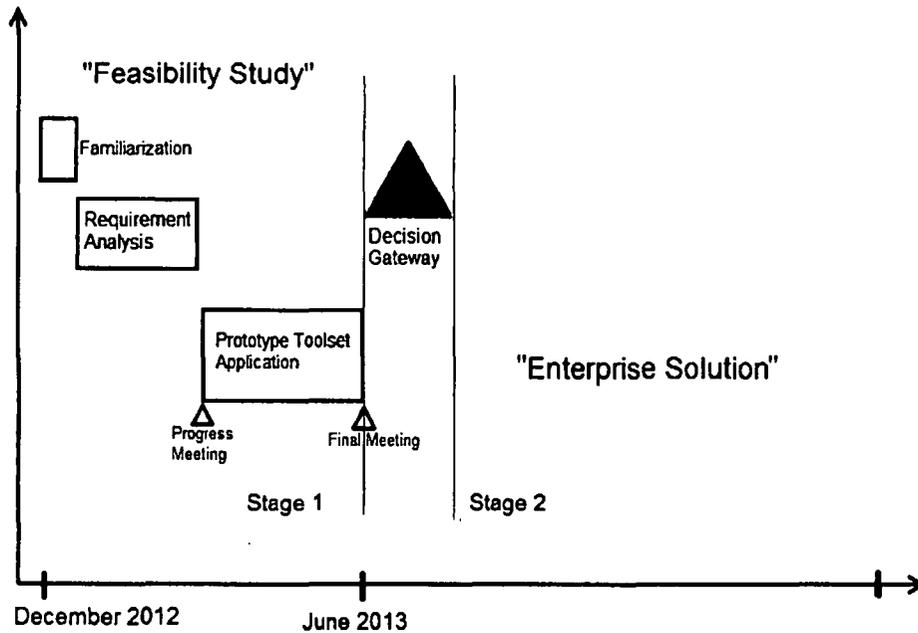


Figure 1: The Estimated Project Schedule

3. OBJECTIVE AND SCOPE

- a. The objective for this contract is to assess the feasibility of technically supporting the APP-15 IER development and IES generation process including use of readily available software to prototype semantic elements.
- b. The contract will cover the feasibility study as the first stage of the APP-15 Project Phase 2. The scope is to:
 - i. Provide and populate a prototype toolset and storage for deliverables including IER and IES.
 - ii. Reuse of existing vocabulary and data structure artifacts (such as Data Lists, Controlled Vocabulary/Data Dictionary, Business Rules, Taxonomy, and semantic diagrams such as Ontology and Domain Information Model). Provide visibility to Reference data and facilitate convergence of multiple IESSs.

4. DEFINITIONS

Refer to Definitions section at Annex 2.

5. APPLICABLE DOCUMENTS

To perform the contract, there are a limited set of applicable documents, less than 10, which are all unclassified. Sample data for the prototype will also be unclassified

6. THE PERIOD OF PERFORMANCE FOR THE CONTRACT

The period to perform the contract will be detailed in the agreed delivery schedule however all deliveries must be completed by June 2013.

7. BIDDING

- a. Bids should address possible license costs (Commercial off-the-shelf, public use etc). The user base of read/write contributors is expected to be less than ten.
- b. CVs of key personnel should be included in bids.
- c. Bid should at least include, besides a detailed overview on the intended programme of work to accomplish to task:
 - a project management plan
 - a risk appreciation and mitigation plan

8. METHOD OF WORK

- a. As the management method of work, the contractor will:
 - i. submit, for approval by NATO Staff, the project management documentation (for example, stage plans, configuration management plan, and risk mitigation plan) using internationally recognized standards and tools (for example, PRINCE2 or project schedule in MS Project tool).
 - ii. undertake the work at their premises. However, a familiarization of 3 days will take place at NATO HQ, including agreement of an initial plan for the remainder of the contract.
 - iii. provide monthly progress reports in writing by digital means in MS Word and PDF.
 - iv. participate in one "Analysis Progress" meeting mid March 2013 and the final Meeting End June 2013 to present his results.
- b. All work will be unclassified.
- c. The Information and Communities of Interest Services Branch(ICOISB) of the NATO HQ C3 Staff is responsible for the execution of the contract and will monitor the progress.

9. APPROACH AND TECHNICAL DESCRIPTIONS

- a. Overall the contractor shall conduct an analysis on the requirements for capturing the necessary elements, relationships and their interaction required to unambiguously express operational requirements for information exchange to allow the development of appropriate technical solutions. Specially the approach shall include:
 - i. Undertake a familiarization that will take place at NATO HQ.
 - ii. Perform a requirement analysis, where at the end of this analysis, a prototype toolset will be identified for a case study. The case study will cover a selected IER-IES development process.
 - iii. Present prototype toolset options for approval following the Requirement Analysis. The prototype toolset will either be commercial-off-the-shelf, publicly available, or any existing no-cost product and is only is expected to serve for this contract.

- iv. Employ the prototype toolset on the basis of the analysis results to support the harmonized and standardized IER development process and the generation of technical solutions. The reference vocabulary, related semantic analysis (e.g. diagrams) for some concepts, IER and IES will be stored in the toolset. The toolset will be both a shared repository for operational and technical community and a configuration management tool.
- b. Additional technical details are as follows:
- i. APP-15 processes shall be mapped to the prototype toolset with relevant sample data. This source of reference data will be the existing MTF data in html, spreadsheet, and word format or in MS Access Database.
 - ii. Current IERs (in Excel format) should be transformed into appropriate formats (e.g. in XML) and the resulting formats should be stored in the data store within the case study. The case study will include one or two change proposals to Message Text Formats. The target Message Text Formats may include some data lists such as ship types, country codes and some information concepts such as organization, unit, and location.
 - iii. The prototype toolset shall demonstrate reuse already available reference data in the development of IERs and IESs and should facilitate harmonization of data element lists (for example country codes) and Data Sponsorship within the reference data (for example data item and codes, IER, XML-MTF).
 - iv. The semantic analysis results, for example semantic diagrams will be used as an aid for a common understanding of domain semantics between technical and operational staff (e.g. Resource Description Framework (RDF) labeled directed graphs). The purpose to generate them is:
 - to define the relationships and context of some concepts/terms,
 - to model a part of whole of an IER/IES,
 - to model metadata and business rules etc.
- c. Many other related data management/data structure efforts are underway through different communities in NATO. Anticipated future NATO products include:
- i. A Metadata Registry - NATO Metadata Registry and Repository (NMRR) that is intended to function as a source for reuse of common reference data.
 - ii. Containers for NATO's architectural models.
 - iii. STANAG Transformation Framework (STF) - a methodology with a set of design rules to transform the man-readable textual representation of STANAG documents into machine readable representations.
 - iv. A bespoke "Vocabulary Tool" built on an Oracle database.

The contract should take these products into account within the scope of the Requirement Analysis but the prototype tool-set will not need to integrate with them.

10. DELIVERABLES

The deliverables are:

- a. An overall assessment of the possibility to utilize semantic tools for the technical support of the APP-15 IER development and the subsequent technical solution generation process.
- b. A prototype toolset that:
 - i. shall demonstrate the IER-IES for the MTF technical solution as a case study on a specific IER to evaluate the capability;
 - ii. shall be based on the analysis, demonstrate if and where potential technology that could aid to the APP-15 process;
 - iii. must be accompanied by User instructions to allow the users repeat the demonstrated process for other IERs sample diagrams.

Extract from Staff Paper

Food For Thought Paper on APP-15 (NATO Information Exchange Requirement Specification Process) Information and Communities of Interest Services Branch (ICOISB), 15 June 2012

1. What is messaging?

- Messaging technologies provide a prime means for today's tactical interoperability (the main alternate being replication based technologies). The traditional binary and character based views are now being complemented with XML based representations as a migration to web-based technologies.

2. What is APP-15?

2.1. Aim and scope

- In line with APP-15's aim and scope defined in the first paragraphs of the Publication, the following slide provides a summarized overview:

APP-15

- **NATO IER Specification Process : APP-15 (MCJSB IERHWG)**
 - development and specification process of generic and solution-independent NATO IERs to express and detail the operational need to exchange information
 - Operational Authority : Military Committee Standardization Boards
 - Resulting IERs to feed the development of appropriate technical implementations (IES)
 - Technical Authority : C3 Board (delegation to CIS Panel)
- **Ambition:**
 - Single production of IERs enabling the development of multiple various and coherent information systems and exchange mechanisms to facilitate and improve their daily use by operational users in the preparation and the execution of operations

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2.2. APP-15 : Operational Publication, however...

- APP-15 is an Operational Allied Publication that is developed under the Tasking Authority of the Military Committee Joint Standardization Board (MC JSB).
- The MC JSB IERHWG (Information Exchange Requirements (IER) Harmonization Working Group) is responsible for the development of the Publication.
- The NATO HQ C3 Staff (NHQC3S) and C3 Board (C3B) substructure provide technical support to the development of the Publication.

2.3. Beyond IER and IES

- Although APP-15 is primarily focused on IER, it also impacts Information Exchange Specification (IES).
- APP-15 is an attempt to facilitate the development of IER and IES in a NATO Network Enabled Capability environment; thus Consultation Command and Control (C3) Board substructure's involvement.
- From a technical point of view, APP-15 focuses mostly on Data and has to address the following:
 - o Common vocabulary reuse,
 - o Data structure reuse,
 - o Reference Data visibility and accessibility for standards design

3. APP-15 Restart

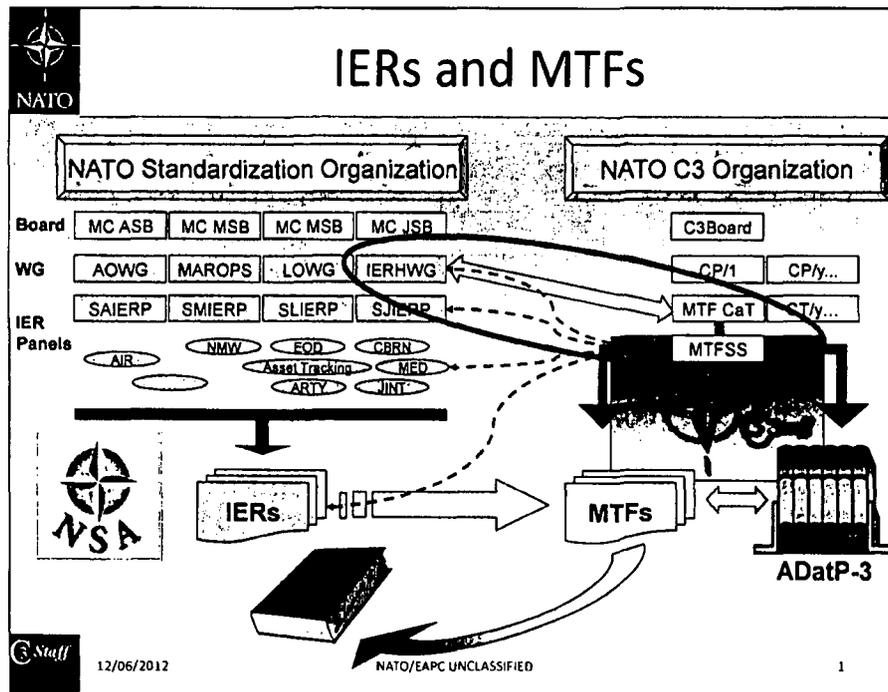
3.1. NHQC3S proposals

- In November 2010, the NHQC3S proposed to the JSB to address the development of a new APP-15 by the means of an incremental approach based on 3 phases:
 - o Phase 1: Development of common IER processes and templates for Message Text Format (MTF) related IER.
 - o Phase 2: Towards Net Centricity (Data structures, Registries, architectures, etc.)
 - o Phase 3: Involvement of TDL Community
- This approach was agreed by the JSB in December 2010
- The JSB tasked the IERHWG to undertake the drafting of APP-15 Ratification Draft 2 restricting the scope to Phase 1, with the technical support of the NHQC3S (MTF).

3.2. APP-15 Phase 1

3.2.1. Rationale

- The main reason for APP-15 Phase 1 to be focused on MTF related IER only is that both the MTF Community (supported by the MTF Capability Team, MTF CaT and MTF Support Staff, MTFSS) and the IER Community (supported by IERHWG and Senior IER Panels) were already working closely together. Details provided in following slide and slide notes:



- IERS for MTFs are developed under the Authority of the Military Committee (MC) Standardization Boards (Air, Navy, Land and Joint): Operational Authority
- These Boards support WG which are Operational sponsors for IERs. They are responsible for IER development and maintenance.
- Each MC Standardization Board (SB) has established Senior IER Panels and specific (functional) IER Panels that are delegated Authority to develop and maintain IERs on behalf of the sponsors.
- The activities of the IER Panels and Senior IER Panels are coordinated by the MC JSB IERHWG.
- The IERHWG is also responsible for the harmonization and the prioritization of IERs.
- The IERHWG plays a central role between the Operational Community (NSO) and the Technical Community (NATO C3 Organization, NC3O).
- Once harmonized and prioritized, IERs are transmitted to the MTFSS/MTF Working Group (MTFWG) for MTF development.
- The IERHWG prioritizes the workplan of the MTFSS, defines the content of the future Publication and defines the Publication schedule and NATO Effective Date of the upcoming Publication
- Once developed, the resulting MTFs are then published by the IERHWG in APP-11 : NATO Message Catalogue covered by Stanag 7149.
- In order to accomplish its tasks, the MTF Community is supported within the NHQC3S by the MTF Support Staff : MTFSS
- The MTFSS also supports the development of IERs from which MTFs are then generated

- The MTFSS works in close collaboration with the Senior IER Panels as well as many specific IER Panels of the NATO Standardization Organisation
- For instance, in the Land Community, the MTFSS collaborates with the SLIERP of the Land Operations Working Group (LOWG) as well as the Artillery WG, the asset tracking WG, the Explosive Ordnance Disposal (EOD) WG, etc.
- A very close liaison is established between the MTF CaT and the IERHWG in order to ensure consistency in the development of MTFs from IERs.
- Conclusion : the development of MTFs is operationally driven by the prioritized development of IERs under the responsibility of the MC JSB IERHWG.

- A more restricted APP-15 process limited to the IER/MTF communities would nonetheless bring the following immediate benefits:
 - o Identical IER development and harmonization processes amongst all operational communities (Air, Navy, Land, Chemical, Biological, Radiological, and Nuclear (CBRN), Logistics, Intel, etc.)
 - o Common IER format provided to the technical Community for IES developments.

3.2.2. Aim

- The aim of APP-15 Phase 1 was to identify quick-wins that would bring immediate benefits to both Operational (IER) and Technical (MTF) communities in the development of their products.

3.2.3. Objective

- The objective of APP-15 Phase 1 was to define common processes and common templates in the development of IER that would subsequently feed the MTF development process.

3.2.4. Benefits

- The benefits for the Operational (IER) Community were that common processes and common IER templates would ease the IER development and facilitate their required harmonization and validation. In other words, it would increase the level of process maturity.
- The benefits for the Technical (MTF) Community were that validated harmonized IER would be provided by a single Operational authority for subsequent MTF development and that required data harmonization would therefore be more easily identified and performed.

3.2.5. Constraints

- Although Data Structures, Architectures, Registries, support of multiple IES, etc. were not part of APP-15 Phase 1 scope, the resulting Publication had to enable potential future inclusion of all these aspects.
- Limitation to available human resources (no additional human resources) i.e : IER Panels, IERHWG, MTF CaT, MTF Support Staff
- Mandatory use of common tools (Microsoft Office suite, etc.) : no investment in specific developments, no use of highly technical tools (such as CASE tools, etc.)

3.2.6. Development

- APP-15 Phase 1 was developed between December 2010 and June 2011.
- APP-15 Phase 1 underwent a trial phase between June 2011 and February 2012.
- Resulting Draft APP-15 Ratification Draft 2, covering APP-15 Phase 1 was finalized in April 2012.
- Draft APP-15 Ratification Draft No.2 (RD2) is expected to be approved by IERHWG 18-22 June 2012.
- It is expected that IERHWG (18-22 June 2012) recommends JSB to launch Ratification process of APP-15 RD2, ending APP-15 Phase 1.

3.3. APP-15 Phase 2

3.3.1. Expected benefit

- The most expected benefit of APP-15 Phase 2 resides in the reuse of common vocabulary for IER and IES design.

3.3.2. Scope

- As mentioned earlier, the scope of APP-15 Phase 2 should embrace:
 - o Registries and Repositories
 - XML: NMRR
 - Architecture : NAR
 - o Common Data Structure (NCDF?) enabling:
 - Reuse of common vocabulary
 - Data structure and reference data harmonization
 - Data structure and reference data Sponsorship (Operational)
 - o Architecture
 - Development of Operational views
 - Based on common vocabulary
 - Populating the NAR

3.3.3. Initial assumptions based on late 2010 situation

- When the NHQC3S proposed the 3 phases approach for APP-15, the C3Board was in the process of reorganizing its substructure.
- The situation at that time was the basis for future developments in the 3 following areas:

3.3.3.1. Data Structure : NCDF

- November 2010 status:
 - o In October 2010, during its last meeting, the ISSC (NC3B-SC/5) agreed the way ahead for JC3IEDM as NATO Core Data Framework : NCDF.
 - o The ISSC recommended in its handover package that this task should be carried forward by the future C3B substructure.
- APP-15 Phase 2 assumption:
 - o It was assumed that when APP-15 Phase 2 would be launched (now) the NCDF issue would have been further progressed by the new C3B substructure and that this new Data Structure would become a strong vocabulary basis for IER developments.
- Since late 2010:
 - o Most of former Data Management Services Working Group (DMSWG) activities have not been re-restarted in the new C3B substructure and the NCDF issues have remained unaddressed since.
 - o The Information and Integration Services Capability Team (IIS CaT) is now in charge of Data Management activities among which the NCDF issue has to be addressed.
 - o Furthermore, the IIS CaT was tasked by CIS CaP to provide technical support to APP-15 Phase 2.
 - o There is currently no established NCDF or other identified NATO agreed Data Structure to support APP-15 Phase 2.
- Consequences:
 - o Assuming that APP-15 Phase 2 will address common vocabulary issues, an agreed data structure would probably have a major role to play; NCDF being a highly potential candidate.
 - o When addressing NCDF issues, the IIS CaT should take into consideration APP-15 Phase 2 considerations and vice-versa.

3.3.3.2. XML Registry

- November 2010 status:
 - o In October 2010, NC3A was developing a prototype NMRR, basis for future requirements for the operational NMRR to be developed under Capability Package (CP) 9C0150.
 - o As an interim solution, a partition of the US Metadata Registry (MDR) was put at NATO's disposal.

- The ISSC recommended in its handover package that Registry related XML activities should be carried forward by the future C3B substructure.
- APP-15 Phase 2 assumption:
 - It was assumed that when APP-15 Phase 2 would be launched (now) progress would have been made towards the NMRR covering potential APP-15 requirements.
- Since late 2010:
 - Most of former XML Services Working Group (XMLSWG) activities have not been restarted in the new C3B substructure.
 - NATO C3 Agency (NC3A) has kept on developing its prototype. This prototype is currently not used by major NATO programs.
 - CP 9C0150 is not yet agreed, hence neither is the project for an operational NMRR.
- Consequences:
 - Assuming that APP-15 Phase 2 will address Registry and Repository issues, the NMRR would have a major role to play.
 - When addressing NMRR issues, the IIS CaT should take into consideration APP-15 Phase 2 considerations and vice-versa.
 - ACT and NC3A are identified as key players in this domain.

3.3.3.3. Architecture

- November 2010 status:
 - In October 2010, NAF was identified by NC3B as the foundation for future Net Centric developments.
 - Architectural views were to be published into the NATO Architecture Repository (NAR) to be developed.
- APP-15 Phase 2 assumption:
 - It was assumed that when APP-15 Phase 2 would be launched (now) progress would have been made towards the NAR covering potential APP-15 requirements.
- Since late 2010:
 - The C3B established the Architecture CaT under its own control.
 - There is currently no available NAR to manage NATO Architecture views.
- Consequences:
 - Assuming that APP-15 Phase 2 will address Architecture views (NOV-3, NOV-7), the NAR would have a major role to play.
 - In order to address Architecture issues and NAR in particular, the IIS CaT as technical support to APP-15 Phase 2 should initiate liaison with the Architecture CaT.
 - Links between NMRR, NAR and NCDF will also have to be addressed as required.
 - In case of failure, without known operational (and system) context (as should be provided by National/NATO Architectural Views), it will be difficult for non-technical authorities to understand and prioritize technical IES development.

o

3.3.4. Conclusion

- On the one hand, the above non comprehensive list of open issues shows that APP-15 Phase 2 as a whole is quite a technical challenge.
- On the other hand, APP-15 Phase 2 is a use case of operational data in a net centric context. It addresses in one project many technical activities either under development or for which studies or developments have already been conducted under the lead of the C3B.
- Most of the identified issues are of relevance for or in the scope of Data Management activities of which the IIS CaT is now in charge.
- As technical support to APP-15 Phase 2 also, the IIS CaT is in a position to either recommend to re-launch required dormant activities or to provide operationally relevant and valuable inputs for many products and policies (to be) developed by the C3B.

4. **APP-15 Way ahead**

4.1. What does it mean "IIS CaT as technical support to APP-15 Phase 2"?

- Although APP-15 is an Operational Publication under the responsibility of Operational Authorities, Phase 2 of its development is above all technical and requires development and advice from a Technical Authority.
- In APP-15 terms:
 - o The Operational Authority is the MC Standardization Boards (mainly JSB) and their substructures.
 - o The Technical Authority is the C3B and its substructure.
- APP-15 development is and remains under the control of the IERHWG.
 - o Drafting of APP-15 updates required by Phase 2 will fall under IERHWG's responsibility.
 - o Technical support for appropriate wording will be required from C3B substructure and/or NHQC3S.
- The role of the IIS CaT as technical support for APP-15 is:
 - o To define an achievable and sustainable level of technical ambitions to support the development of future IER and IES in a Net Centric environment,
 - o To recommend (for approval) appropriate technical solutions supporting these ambitions,
 - o To subsequently propose appropriate required changes to the current process and technical evolutions of the current IER templates,
 - o To ensure availability of technical solutions and associate resources are available to support the defined level of technical ambitions,

- To provide an appropriate technical handbook in support of APP-15 Phase 2 describing all required technical activities to be conducted.

4.2. Proposed way ahead

4.2.1. 1st IIS CaT meeting conclusions on APP-15

- The IIS CaT (Data Management Syndicate) :
 - recognized the technical support to APP-15 Phase 2 as part of its Work Plan,
 - agreed that the NNEC Data Strategy was the relevant framework for this task,
 - recognized that a thorough technical study was required to determine potential workable solutions for APP-15 Phase 2,
 - recognized that lots of efforts had already been put in the past in many identified technical areas of interest for APP-15 Phase 2 and that it was of mutual benefit for NATO, Nations and other stakeholders to maximize the reuse of existing knowledge and products to support it,
 - agreed to map APP-15 processes to identified infrastructure,
 - agreed to collect technical inputs and views from Nations and stakeholders in the purview of Phase 2 in order to identify appropriate orientations and priorities for the technical study,
 - agreed that these inputs would be reviewed and discussed during the next IIS CaT meeting to determine a way ahead,
 - requested the NHQC3S to provide a point paper on APP-15 including proposals for the future in order for Nations and stakeholders to better scope their contributions. (This document!)

4.2.2. NHQC3S/ICOISB considerations

- Based on lessons learned from the past and failure of APP-15 Ratification Draft 1 in particular, it appears that a "Big Bang" approach is not to be recommended.
- Although the global picture needs to be taken into consideration, it is very unlikely that all identified issues will be solved simultaneously.
- It seems therefore reasonable to address issues in a parallel and progressive manner in order to let required complex infrastructure develop.
- A step by step approach can be proposed in order to get quick benefits and progressively move towards the full expected scope.
- Quick wins are to be based on maximizing reuse and improvement of existing components and infrastructure.
- Involvement of ACT and NC3A is crucial in this domain.

4.3. NHQC3S/ICOISB proposal

- The NHQC3S/ICOISB proposes the following incremental Phase 2 development approach:
 - o Step 1 : Repository to enable reuse of XML components
 - o Step 2 : Data Structure (NCDF)
 - o Step 3 : Architecture (NOV, NAR)

4.3.1. Step 1 : Repository

- Main effort:
 - o The main effort of this first step would consist in establishing, populating, managing and using a Repository to store common vocabulary (Reference Data), IER and IES.
- Scope:
 - o First potential minimum candidates to populate Repository : IER and MTF.
- Benefits:
 - o Reference Data visibility, accessibility, reusability, etc.
 - o Enhanced data sponsorship and harmonization
- Existing and encouraging signs:
 - o NMRR prototype as a starter (required support from NC3A)
 - o On US proposals, the MTF CaT is considering a new XML-MTF schema design in order to ease accessibility of XML-MTF data and enable easier reusability
 - o The IERHWG is already in charge of data harmonization (current example on country codes) and is addressing operational data sponsorship issues
 - o The Senior IER Panels are already responsible for sponsoring operational data as part of their IER
- Minimum tasks to be performed:
 - o To establish an NMRR:
 - Start with NC3A prototype : IIS CaT to coordinate with NC3A and ACT
 - IIS CaT to ensure that NMRR developed under CP 9C0150 fulfils requirements
 - Swap from prototype to operational
 - o To establish Namespace management:
 - Registry to be organized to enable proper reuse of XML artifacts
 - IIS CaT to develop Namespace management rules as part of data management and recommend proper structure and organization
 - o Tools: to study tooling aspects with NC3A, ACT and NHQC3S
 - To enable transformation of current IER (Excel documents) into appropriate formats and store resulting artifacts in Repository
 - To enable reuse of accessible artifacts from Repository in development of IER and IES
 - o Repository population:

- to populate Repository with existing IER once tools are developed
- XML-MTF : MTF CaT, NHQC3S and APP-11 Custodian to address population of XML-MTF artifacts
- Data harmonization:
 - IERHWG to organize and launch proper data harmonization based on IER and MTF Repository population
 - Use of harmonized data to be enforced in future IER/IEs developments
- Data sponsorship:
 - IERHWG to organize and manage sponsorship of relevant operational data by Senior IER Panels
- Risks:
 - ACT's agreement to make NC3A prototype available for APP-15 purposes.
 - Sustainability of Repository (funding pipeline is year by year)
- Risks mitigation:
 - Use of National/stakeholder solution.

4.3.2. Step 2 : Data structure

- Main effort:
 - To determine and establish appropriate data structure to support IER/IES development activities, reusing/sharing relevant XML artifacts from Repository
- Decision:
 - IIS CaT to recommend data structure based on inputs from Nations (as identified tasking from first IIS CaT meeting)
- NHQC3S/ICOISB recommendation:
 - Data structure to be based on existing National/Stakeholder solutions
 - Based on resource constraints, it is very unlikely that the development of a brand new data structure could start from scratch
 - Modeling activities are costly
- Further planning:
 - Further planning is highly dependent on decisions made on data structure
 - Interaction with IER/IES and Repository to be taken into consideration within study and decision making process on data structure
- Risks:
 - No National/stakeholder solution made available
 - Potentially more sophisticated solution than needed for APP-15 process (requiring too many resources, too costly, etc.)
- Risks mitigation:
 - Use of a Data Dictionary for Reference Data and skip Step 2.

4.3.3. Step 3 : Architecture

- Main effort:
 - o To determine and establish appropriate architectural infrastructure and organisation to support IER/IES development activities, reusing/sharing relevant artifacts from Repository
- Decision:
 - o IIS CaT to recommend solution for IER/IES architecture views based on inputs from Nations (as identified tasking from first IIS CaT meeting)
- NHQC3S/Information and Community of Interest Services Branch (ICOISB) recommendation:
 - o Views modeling activities to be identified, organized and resourced
 - o Work to be conducted with Architecture Capability Team (CaT)
 - o Population of NOV-7 with reusable semantics from Repository/Data Structure
- Further planning:
 - o Further planning is highly dependent on decisions made on Architecture. Development of technical views could be envisaged.
 - o Steps 2 (Data Structure) and 3 (Architecture) can be conducted either simultaneously or in sequence. However, a strong interaction is identified for NOV-7 at least.
- Risks:
 - o Non availability of infrastructure (NAR)
 - o Too sophisticated solution for APP-15 process (requiring too many resources, too costly, etc.)
- Risks mitigation:
 - o No Architecture developments; cancel Step 3.

4.3.4. ICOISB concluding remarks

- The intent of ICOISB's proposals is to avoid repeating errors of the past and make APP-15 Phase 2 a success.
- Step 1, in terms of common vocabulary reuse, is the most critical step for APP-15 Phase 2.
- Although Steps 2 and 3 would be very beneficial for a long term enterprise roadmap, their achievements are not "sine qua non" conditions for the success of APP-15 Phase 2.

5. DEFINITIONS

- 5.1. **APP-15:** NATO IER Specification Process. APP-15 defines steps that are necessary to produce harmonized IERs and to execute IER configuration management (CM). It does not cover the development of the appropriate technical solution, though it describes the necessary interface between the operational and technical community.

- 5.2. **DAMA–DMBOK:** Data Management Body of Knowledge Data Management Organization. It is an established introduction to data management by the Data Management Association.
- 5.3. **EDIFACT:** United Nations/Electronic Data Interchange for Administration, Commerce and Transport. The EDIFACT standard provides a set of syntax rules to structure, an interactive exchange protocol and provides a set of standard messages which allow multi-country and multi-industry exchange of electronic business documents.
- 5.4. **IER:** Information Exchange Requirement (Product of 'operational' community).
- 5.5. **IES:** Information Exchange Specification (Product of 'technical' community). IES in this project is MTF development by NHQC3S from IER as submitted by operational community.
- 5.6. **JC3IEDM:** JC3IEDM (Joint C3 Information Exchange Data Model) was a semantic reference for C3 information to facilitate interoperability. It was designed to provide reference data and definitions, the data structures for systems and information exchange mechanisms.
- 5.7. **MTF:** Message Text Format. Standardisation of MESSAGEs used for information exchange will improve interoperability between different national and NATO authorities and systems. To that end, the NATO Message Text Formatting System (FORMETS) provides the rules, constructions and vocabulary for standardised CHARACTER-oriented MESSAGE TEXT FORMATS (MTF) that can be used in both manual and computer-assisted operational environments. FORMETS is specified in Allied Data Publication Number 3 (ADatP-3).
- 5.8. **NAF:** NATO Architecture Framework. NAF provides a common framework for presenting specifications and models of technical systems, missions, organizations etc. that may be involved in NATO operations at many different levels and in many different contexts. Architectures can be represented by models. For example there are NATO Operational Views (NOV) such as NOV-3 (Operational Information Exchange Requirements) and NOV7 (Information Model) in NAF. The purpose of the Operational Information Requirements subview (NOV-3) is to identify and describe all information exchanges that make up all information needs between operational nodes. The purpose of an information model (NOV-7) is to analyze the information aspects of the operational domain and to guide the design of information systems.
- 5.9. **NAR:** NATO architecture repository is the basic storage for all NATO architecture descriptions including operational, system and technical views. NATO architectural views provide operational and system context to facilitate technical IES development. NATO architectural views (for example NOV3, NOV7) are not developed yet. Once generated, they will be submitted to NAR. Currently, there is no such repository to manage the architectural views.
- 5.10. **NSA:** NATO Standardization Agency.
- 5.11. **NCDF:** NATO Core Data Framework. NCDF is envisaged (yet to be approved) a set of models divided into a three layer structure consisting of a core model, common models and specific models for each Service, Function or Community.

- 5.12. NMRR:** NATO Metadata Registry and Repository. The NATO Communication and Information Agency (NCIA) has developed a prototype registry NMRR to be the basis for an operational product under the authorized capability package (CP 9C0150). As an interim solution, NATO uses a partition of the US MDR (Metadata Registry).
- 5.13. NNEC:** NATO Network Enabled Capability. NNEC is the Alliance's cognitive and technical ability to federate the various components of the operational environment through a networking and information infrastructure.
- 5.14. STF:** STANAG [standardization agreement] Transformation Framework. It introduces a methodology with a set of design rules to transform the man-readable textual representation of STANAG documents into machine readable representations. STF has been implemented in some domains at NATO.