# MIP Information Model

The Multilateral Interoperability Programme (MIP), a military standardization body comprising 26 member nations and NATO, aims in this brochure to explain to a non-technical audience what the MIP Information Model (MIM) is, how it helps achieve Command and Control interoperability and how it relates to the JC3IEDM. *Last Update: September 2014*

Scope, Objectives, and Principles

The MIP Information Model (MIM) provides the semantic foundation for information exchange in the Command and Control (C2) domain.

Its development is driven by the needs of the warfighters and its scope is defined by military information exchange requirements for multiple echelons in joint/combined operations.

The MIM embodies all the operational concepts of the JC3IEDM. Based on a few basic notions, such as «Object», «Action», and «Metadata», the model provides semantically rich taxonomies of militarily relevant concepts.
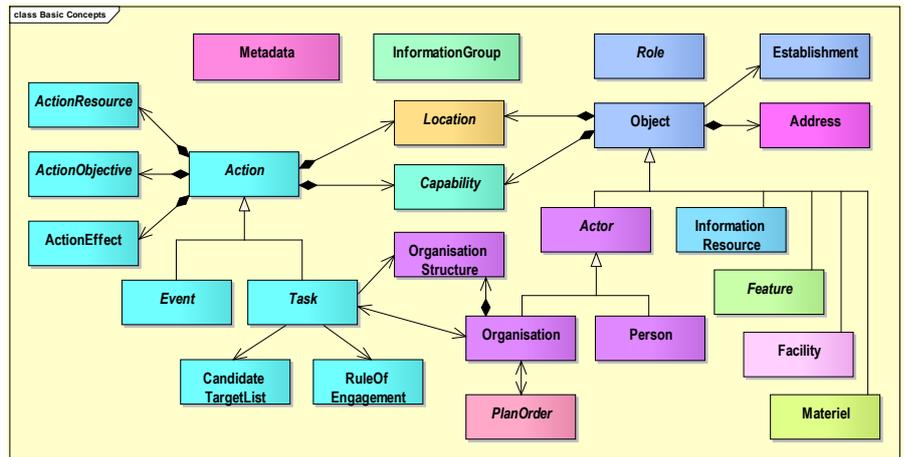
The MIP has designed the MIM with regard to readability, modularity, extensibility, semantic strictness, and model consistency. As the result of several years of development it represents a valuable contribution to the service design for future mission networks, data modelling efforts within NATO, and specific communities and organisations within and related to the C2 domain.

The MIM employs state-of-the-art modelling techniques and tools based on open standards and industry best practices. The model is platform-independent as it is not tied to a specific exchange technology. It supports the Model-Driven Architecture (MDA) approach which facilitates the efficient development of data exchange schemas. At the same time focusing on semantic aspects eases communication between and among operational subject matter experts and system engineers.

Semantic Reference for a Service-Oriented Architecture

The MIM is considered a «semantic reference» for the C2 domain from which different modular interoperability specifications can be derived. The MIM will allow the generation of diverse exchange specifications allowing its reuse across systems, interfaces and Communities of Interest.

The MIM supports MIP's service-oriented approach towards a future interoperability solution. Unlike the JC3IEDM, which is an integral part of the MIP Baseline 3.1 specification, the MIM is separate from an interoperability specification, as can be seen in the diagram on the right. While the JC3IEDM defines a database schema that specifies the interface that systems must implement, the MIM describes operational concepts.
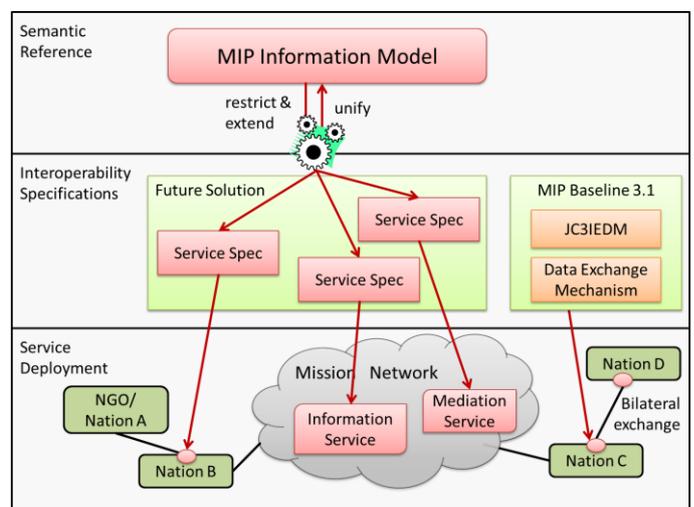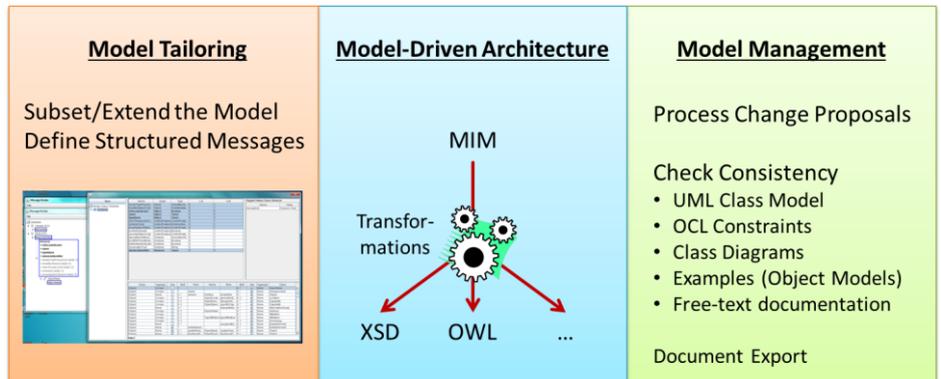
Selected subsets of the MIM will be included in the various modular interoperability specifications currently under development by MIP. The latter combine both the data structures and the details of the exchange mechanism. They can be used in multiple ways for example bilateral nation-to-nation and nation-to-NGO information exchange, or for information and mediation services as part of a coalition mission network.

The MIM can be considered as a toolbox: by following a tool-supported process, traceability from the service specifications back to the MIM is guaranteed. As a common semantic reference in the background, the MIM ensures that information exchanged by the resulting services will be consistent and composeable. The ability to couple services when needed is a significant improvement to the traditional way of defining individual messages/services.

MIM Tool Suite

The MIM is complemented with a comprehensive suite of software tools that make the adoption and adaptation of the MIM as easy as possible. In order to customize the MIM for a specific capability or service, a dedicated tool allows defining a subset of the MIM, which is structurally compliant with the overall model. MDA is supported by a library of model transformations that allow deriving platform-specific

models from the MIM automatically. Standard representations for «XML Schema Definition» (XSD) and «Web Ontology Language» (OWL) will come with the MIM 3.0. To ensure that all pieces of the information model fit together, tools have been developed for model management. All tools are built on top of Sparx Enterprise Architect, the UML modelling tool used for MIM. The tools are continuously enhanced by an active group of developers and written in Java. They are available as open source software for MIP members and interested parties.

Roadmap and Cooperation with NATO
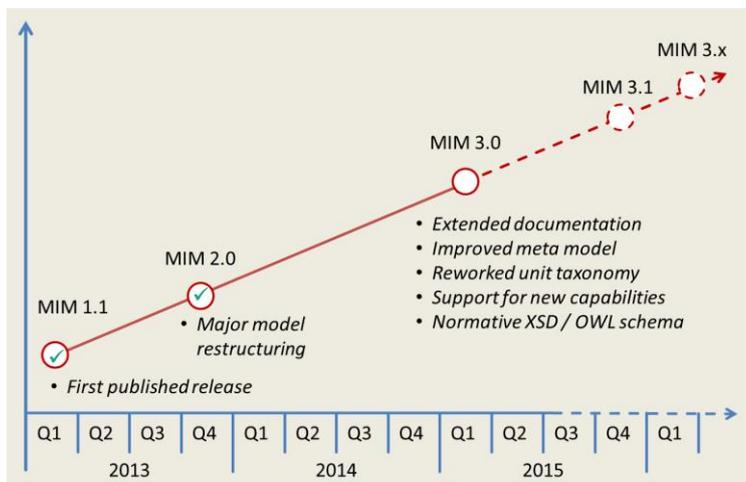
The MIP considers data modelling as a continuous and agile process that must quickly respond to new operational requirements. Standardization requires stable releases. In order to meet this requirement, MIP plans a 12 to 18 month timeframe between any major releases of the MIM, with minor and critical operational updates released when needed.

In December 2013, MIP released the MIP Information Model 2.0 and made it available to other Communities of Interest. Since then, many significant improvements have been made and a new version 3.0 will be released in the first quarter of 2015. Key features will include extended documentation, support for new MIP capabilities, further fixes for known JC3IEDM problems, and an improved unit taxonomy to simplify mapping on existing standards for tactical symbols.

MIP has submitted a proposal for a new cover STANAG to the NATO C3 Board. It recommends using the MIP Information Model for the definition of information exchange specifications to aid full interoperability of NATO Forces. MIP is also seeking to add the MIM to the NATO Interoperability Standards and Profiles (NISP) and the NATO FMN Implementation Plan (NFIP) as the semantic reference model on which future specifications should be based.

Join the MIM Community

All MIM-related products can be found at https://www.mimworld.org. The website hosts introductory documentation, the information model in Sparx Enterprise Architect format, services to browse the model online, and the tool suite as binary installer and source code. Interested parties are invited to provide feedback via the MIM portal. For general information on the Multilateral Interoperability Programme (MIP), please see http://www.mip-interop.org.