

The MarNIS Architecture

Marit Natvig, SINTEF, Norway

marit.natvig@sintef.no



Content

- The architecture
 - Overall information
 - Content and establishment approach
- Definition of concepts by means of the architecture elements
 - Examples
- If time and interest I can also show some details (browse through the hierarchy of models, etc.)



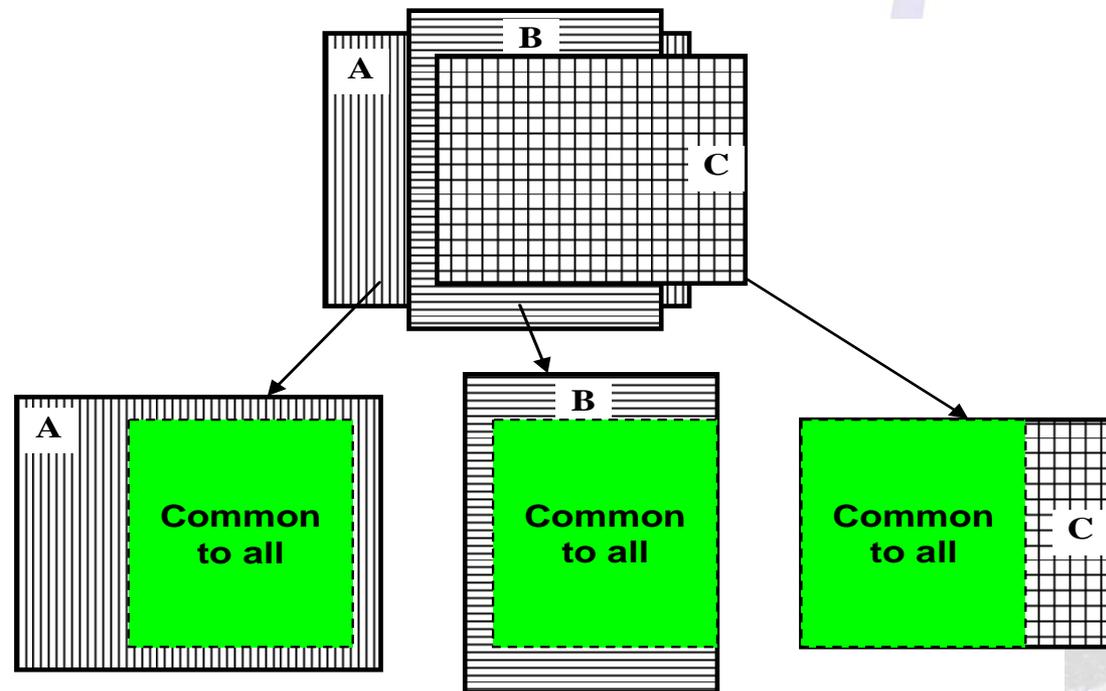
The MarNIS architecture

- A total picture of maritime traffic and transport to arrange for better solutions
 - The context in which the solutions shall operate
 - Relations and dependencies
- Independent of organisation and local/regional ways of doing things
- Formal definitions and specifications
 - Structured approach
 - Models
 - Consistency
- Support implementation of solutions
- Further discussions about solutions will be required, and such discussions may be supported by the architecture
- Shows the maritime sector as a part of the total transport sector
 - Arrange for co-modal transport
 - Achieve synergies



The architecture must be independent of local ways of doing things

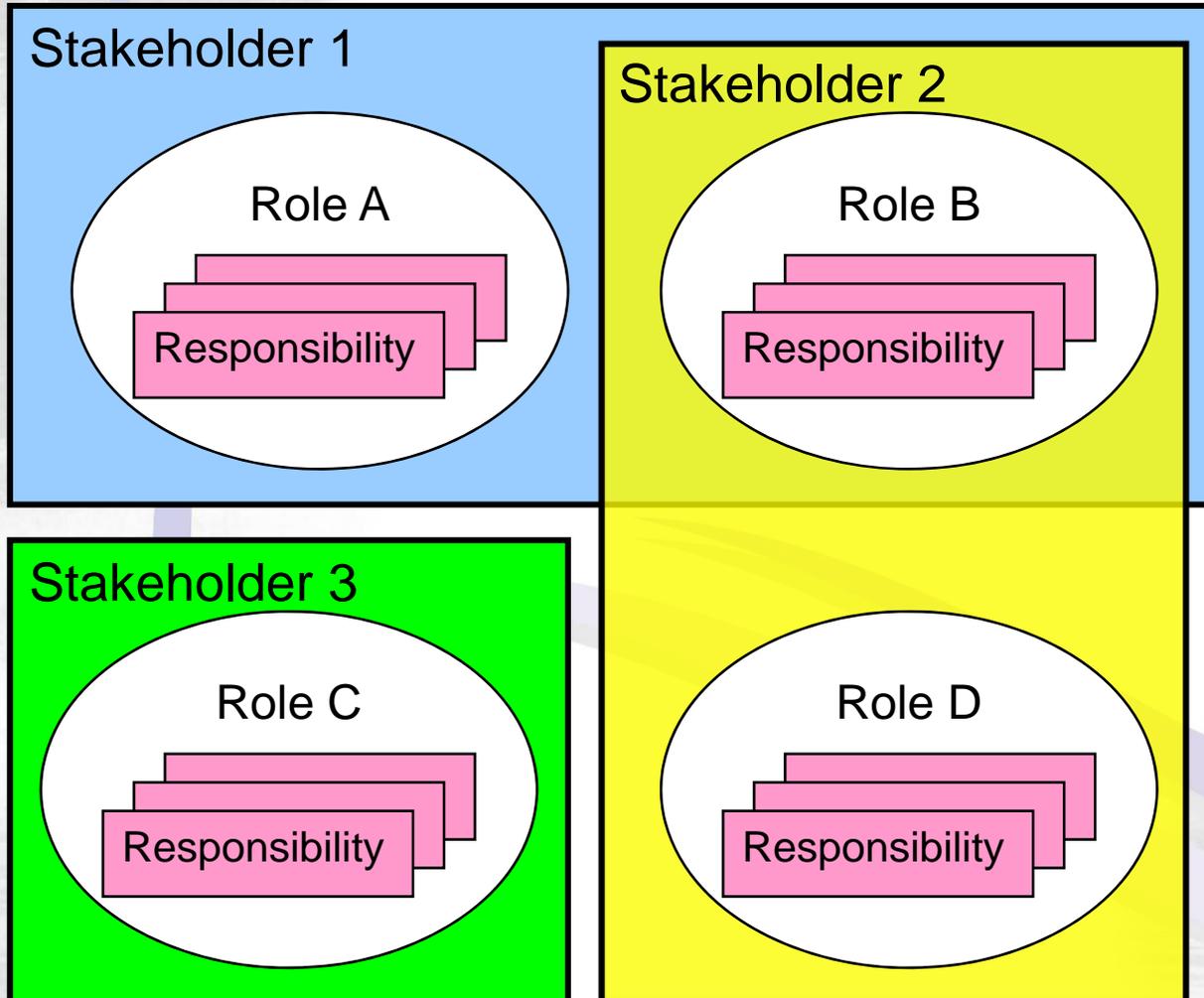
- Different regions and organisations have different solutions
- Some core responsibilities will always be present
- Support local differences through focusing on these responsibilities



Responsibility centric architecture
A role represents unique sets of responsibilities



Roles

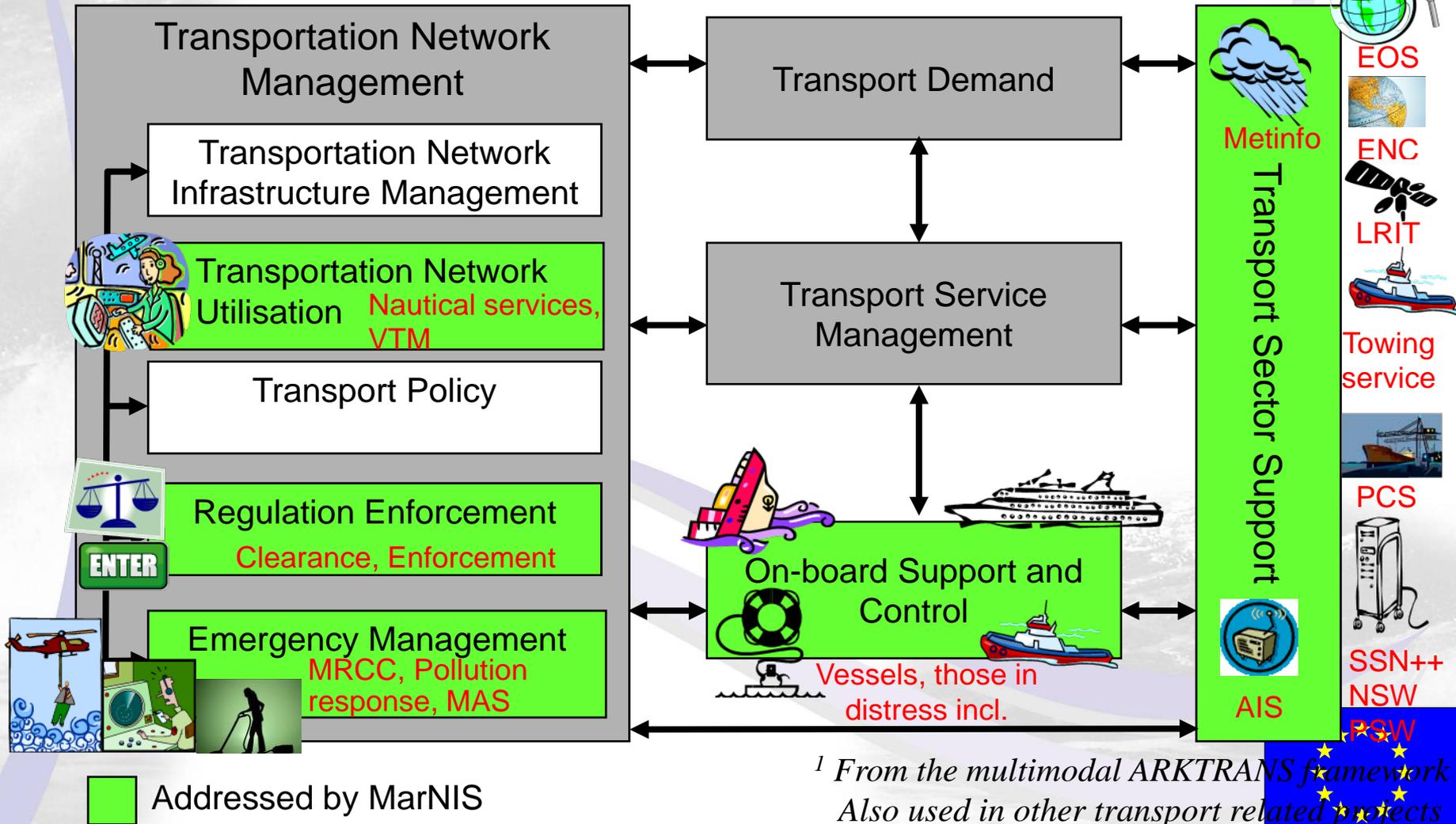


- The architecture uses roles instead of stakeholders
- Represent unique sets of responsibilities
- Independent of organisation and local or regional ways of doing things
- Support Pan-European solutions



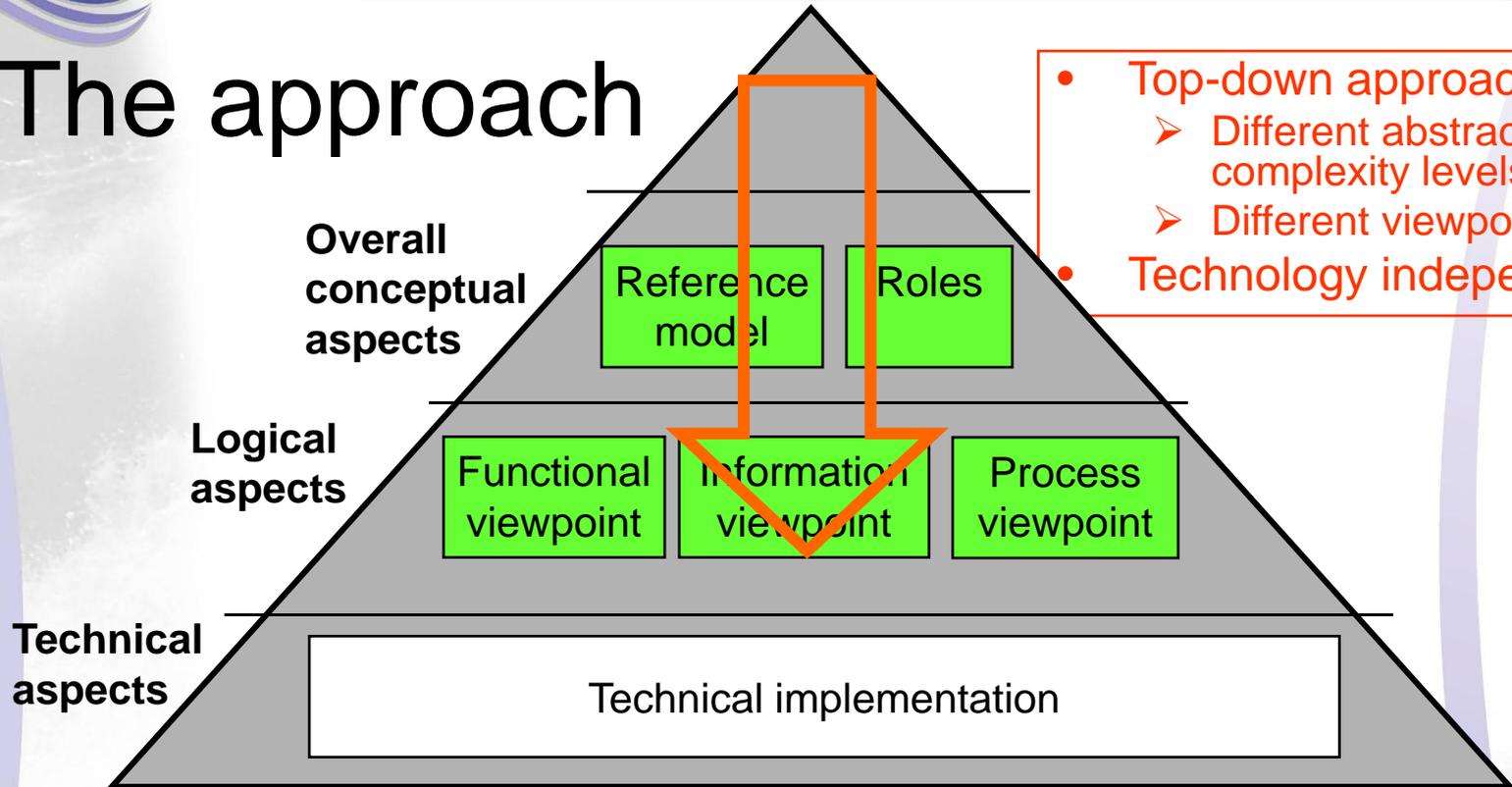
Facilitates synergies between projects, activities and transport modes.
Shows how MarNIS fits into a wider context (e.g. co-modal transport chains)

Reference Model¹



¹ From the multimodal ARKTRANS framework
Also used in other transport related projects

The approach



- Top-down approach
 - Different abstraction or complexity levels
 - Different viewpoints
- Technology independent

- For each responsibility domain of the Reference Model
 - Roles with responsibilities (one role belongs to just one domain)
- For each Role
 - Tasks that contributes to the fulfilment of the responsibilities
- Processes define how to fulfil responsibilities
 - How tasks are interact/collaborate (information exchange)
- Information elements



- Cargo o/v**
- + CrewEffectItem
 - + DGInfo
 - + DutableCrewEffects
 - + GeneralDescriptionOfCargo
 - + GerenralDescriptionOfDG
 - + NumberOfPersonsOnBoard
 - + Stores
 - + StoresItem

- Clearance Status**
- + ClearanceStatus
 - + ClearanceStatusType

- Class and Certificates**
- + ISMCertificate
 - + ISSCertificateStatus
 - + SafetyManagmentCertificate
 - + Certificate
 - + CertificateCodeType
 - + ClassAndCertificates
 - + DeclarationOfHealthInfo
 - + FlagRegistration
 - + GasFreeCertificate
 - + RegistrationCertificate
 - + ShipClass

- Crew Data**
- + CrewOverview
 - + CrewData
 - + CrewMemberData
 - + OnBoardDutyCodeType
 - + OnBoardDutyCodeType_EPC2
 - + OnBoardDutyType
 - + ShortCrewMemberData

- Core Data**
- + ReportPosition
 - + ReportPositionFix
 - + ReportTime
 - + Amount
 - + CargoLocation
 - + CertificateStatusType
 - + ContainerLocation
 - + ConectInfo
 - + CoordinateType
 - + CountryCode
 - + FeederLocation
 - + GenderType
 - + IdDocumentType
 - + Location
 - + NameType
 - + OtherLocation
 - + Party
 - + PersonIdDocumentType
 - + Port
 - + QuantityType
 - + QuantityUnitType
 - + ROROLocation
 - + TankerLocation
 - + ebXML Core Components

- Dangerous Cargo Data**
- + EmergencyDescription
 - + DGSafetyDataSheet
 - + PackingGroupType
 - + PollutionCodeType
 - + UNClassType
 - + UNNumberType

- General Cargo Data**
- + ContainsDangerousGoods
 - + BulkCargoHandling
 - + CargoData
 - + CargoItem
 - + CargoItemOrigin
 - + CargoStatisticsData
 - + CargoType
 - + GoodsType
 - + LocationCodeType
 - + NonCargoType
 - + OnBoardLocationType
 - + SpecialCargoDetails
 - + TransportUnitInfo

- Passenger Data**
- + AssistanceRequests
 - + ExtendedPassengerMemberData
 - + PassengerData
 - + SimplifiedPassengerMemberData

- Security**
- + CurrentShipSecurityLevel
 - + ISPSAble
 - + ISSCInformation
 - + OtherSecurityInformation
 - + SecurityInfoShipToShip
 - + SecurityLevelInPort
 - + SecurityLevelInPreviousPorts
 - + ShipToShipActivity

Information elements for information exchange with authorities (1:2)

Port Entry/Departure Notifications (PEN/PDN)

Port Entry/Departure Profiles (PEP/PDP)



- Services**
- + Bunkers
 - + GeneralServiceRequest
 - + Pilots
 - + Service
 - + Tug

- Ship Contacts**
- + AgentContactInPort
 - + Charterer
 - + Company
 - + CompanySecurityOfficer
 - + InmarsatCallNumber
 - + NameOfMaster
 - + PaymentsContacts
 - + ShipContacts
 - + ShipOwner

- Ship ID**
- + CallSign
 - + FlagState
 - + Id
 - + IMONumber
 - + MMSINumber
 - + ShipID
 - + ShipName
 - + ShipRegistration

- Ship Particulars**
- + INFShipClass
 - + ShipType
 - + AccommodationLadderLocation
 - + AdditionalDetailsForShipHandling
 - + Beam
 - + CargoAreaLength
 - + CargoGearDescription
 - + DeadWeight
 - + DepartureDraught
 - + DoubleBottom
 - + DoubleBottomType
 - + GrossTonnage
 - + IceClass
 - + IceClassId
 - + IceClassType
 - + IceClassTypeBaltic
 - + IceClassTypeACS
 - + INFShipClassType
 - + LengthOverall
 - + MooringLinesDescription
 - + NetTonnage
 - + OperationalConditionOfEquipment
 - + ShipParticulars
 - + ShipTypeType
 - + SummerDraught

- Vessel Operation Data**
- + IncidentOrAccidentDischarge
 - + IncidentOrAccidentSeverity
 - + AirDraught
 - + ArrivalDraught
 - + DistanceShipSideToHatch
 - + DistanceWaterLineToFirstHatch
 - + FuelType
 - + IncidentOrAccidentDischargeType
 - + IncidentOrAccidentSeverityType
 - + IncidentOrAccidentType
 - + LastExpandedPSCInspectionDate
 - + PlannedOperations
 - + PurposeOfCallType
 - + RemainingOnBoardBunkers
 - + TankCondition
 - + TankConditionInformation
 - + TankStatusType

- Voyage Data**
- + ATA
 - + ATD
 - + ATP
 - + CurrentPort
 - + ETA
 - + ETD
 - + ETP
 - + PositionType
 - + PreviousVoyageNumber
 - + VoyageNumber
 - + ArrivalBerth
 - + Berth
 - + CommercialVoyageIdentification
 - + ConsecutivePortCallList
 - + DepartureBerth
 - + LastPortOfCall
 - + NextPortCall
 - + PeriodOfStay
 - + PortOfArrival
 - + PortOfDeparture
 - + PortOfDestination
 - + PortOfOrigin
 - + Position
 - + PreviousPortCallList
 - + TimeEstOrAct
 - + VoyageData
 - + VoyageType

- Waste**
- + Waste
 - + WasteDeliveryIndicator
 - + WasteInformation
 - + WasteList
 - + WasteType

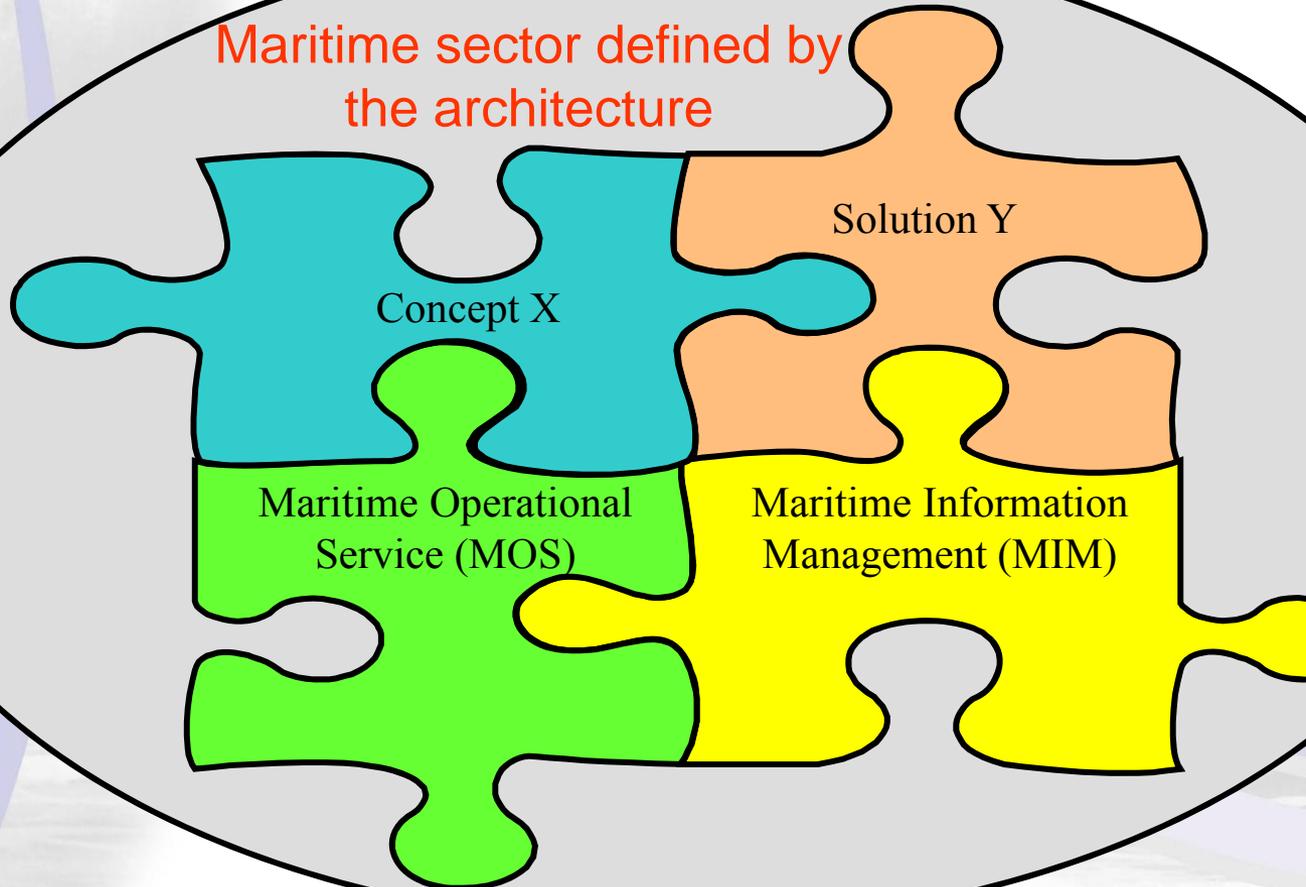
Information elements for information exchange with authorities (2:2)

Further discussed and refined in the ISO TC 8 standardisation committee (ISO 28005 on Electronic Port Clearance)



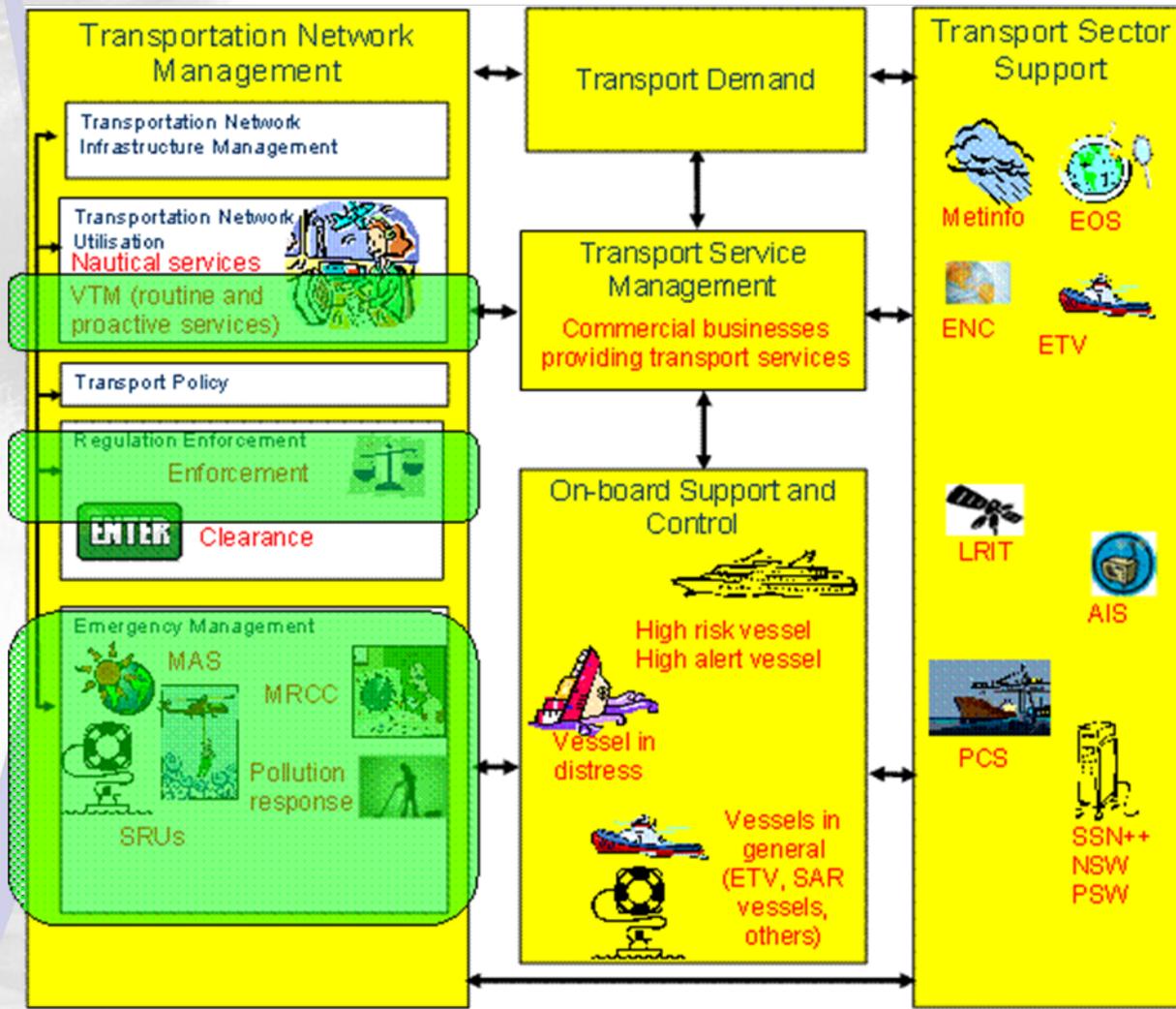
Concepts defined by means of the architecture

Maritime sector defined by the architecture



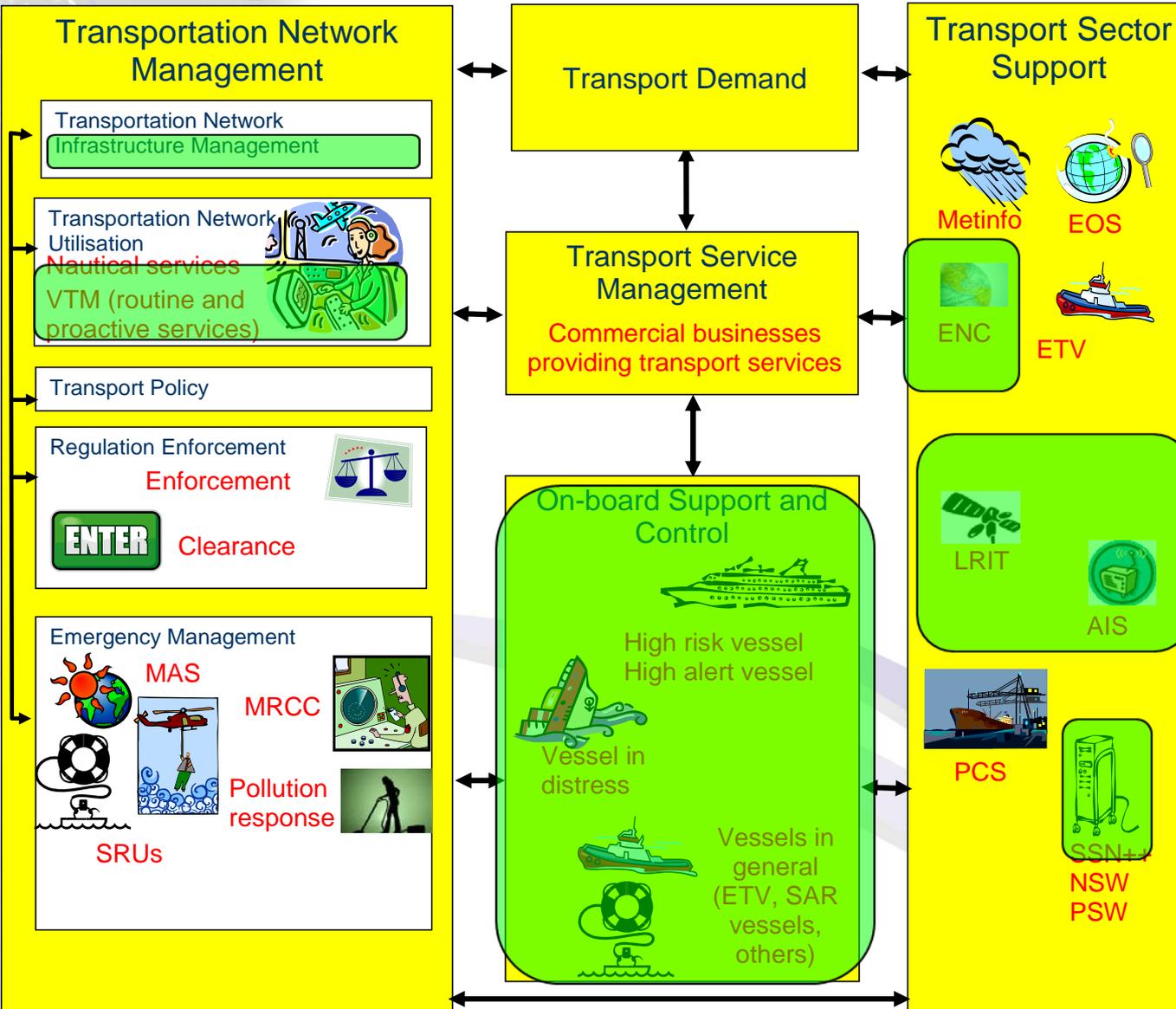
- The concepts fit with other concepts and solution
- They are a part of a total picture
- They are well defined

The MOS (Maritime Operational Service) concept



- Define the roles involved for each relevant area
- Define the tasks involved for each role
- Define the related processes (with interactions)





The architecture can support the definition of eNavigation

- Will arrange for consistency and clarity
- Will support discussions and decisions
- (Should be defined in a functional and logical way - Not by referring to technologies or hardware)

Just an example
Probably not correct



Conclusion

- The MarNIS architecture puts the MarNIS solutions into a context
- Provides formal definitions and specifications that
 - Are independent of organisation and local or regional ways of doing things
 - Support accurate definitions and common understanding
 - Support implementation of interoperable solutions in different countries and regions
- The architecture can be used as a tool for discussions and specifications when new concepts and solutions are to be defined

