Bringing service to life

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Enterprise Architecture Model-Driven Simulation

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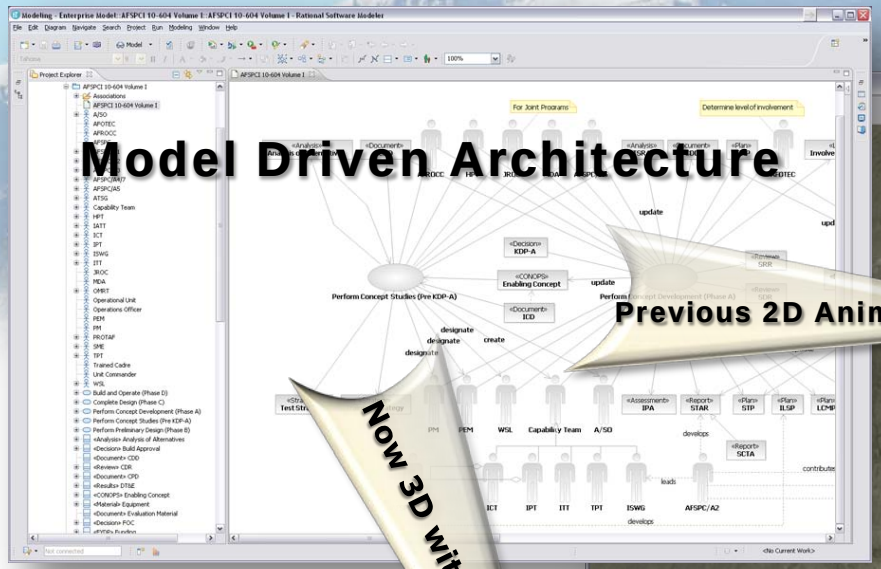
Introduction

- Enterprise Architecture Challenges
- The Vision…
- Introduce enterprise architecture strategy to task using the Unified Profile for MODAF and DoDAF (UPDM)
- Discuss enterprise architecture process
  - The object-oriented method…
- Demonstrate Enterprise Architecture Model-Driven Simulation

Some significant challenges…

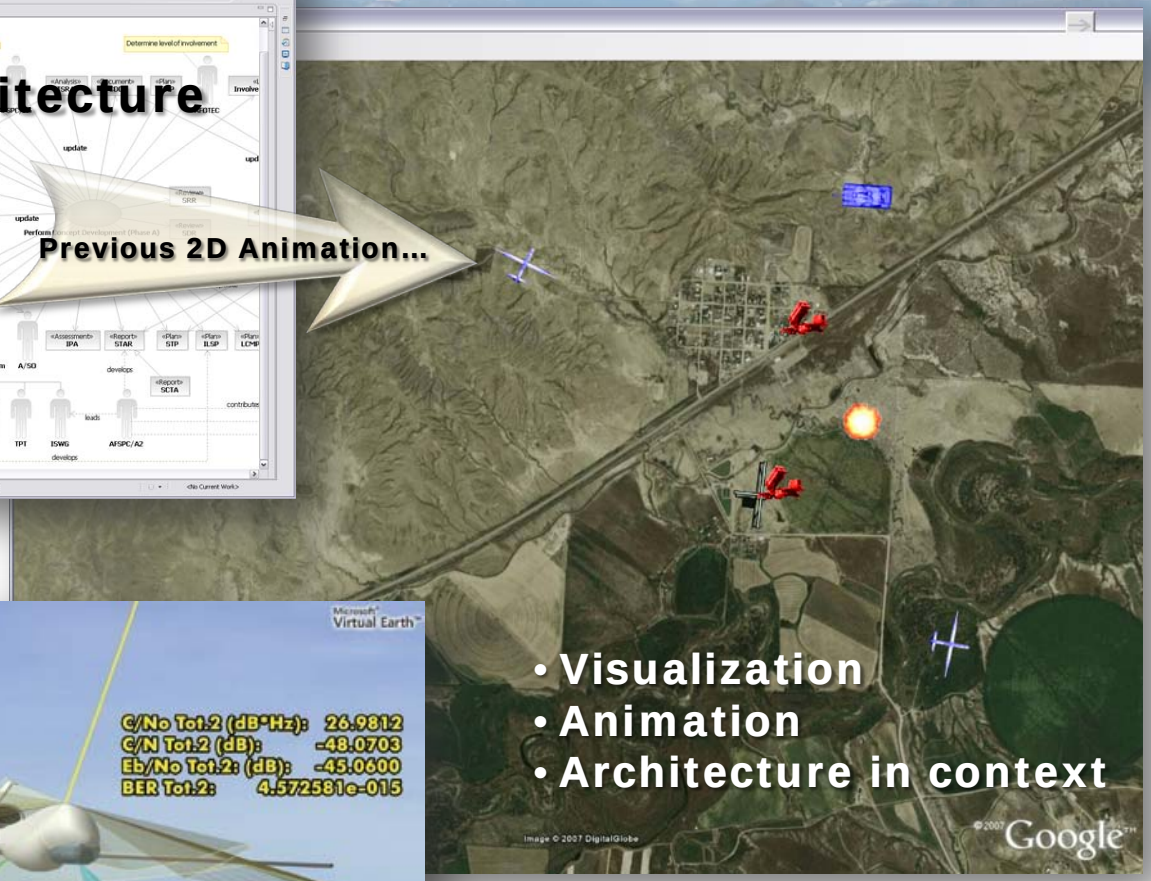
- Effectively defining, modeling, and communicating enterprise complexity
- Ensuring required operational capabilities drive system development – linking capabilities directly to enterprise components
- Identifying and managing enterprise and program boundaries
- Recognizing reusable operations and components to reduced ownership cost
- Coping with change (threats, missions, operations, organizations responsibilities, technology, etc.)

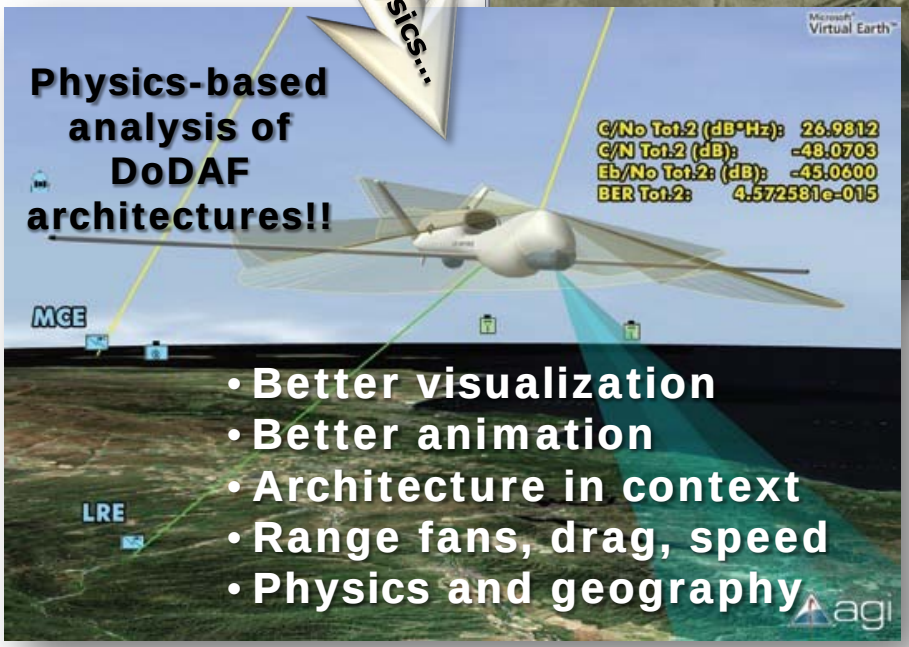
The Vision…



Previous 2D Animation…

Now 3D with physics…





Great value in integrating Enterprise Architecture with AGI's analysis and visualization tool…

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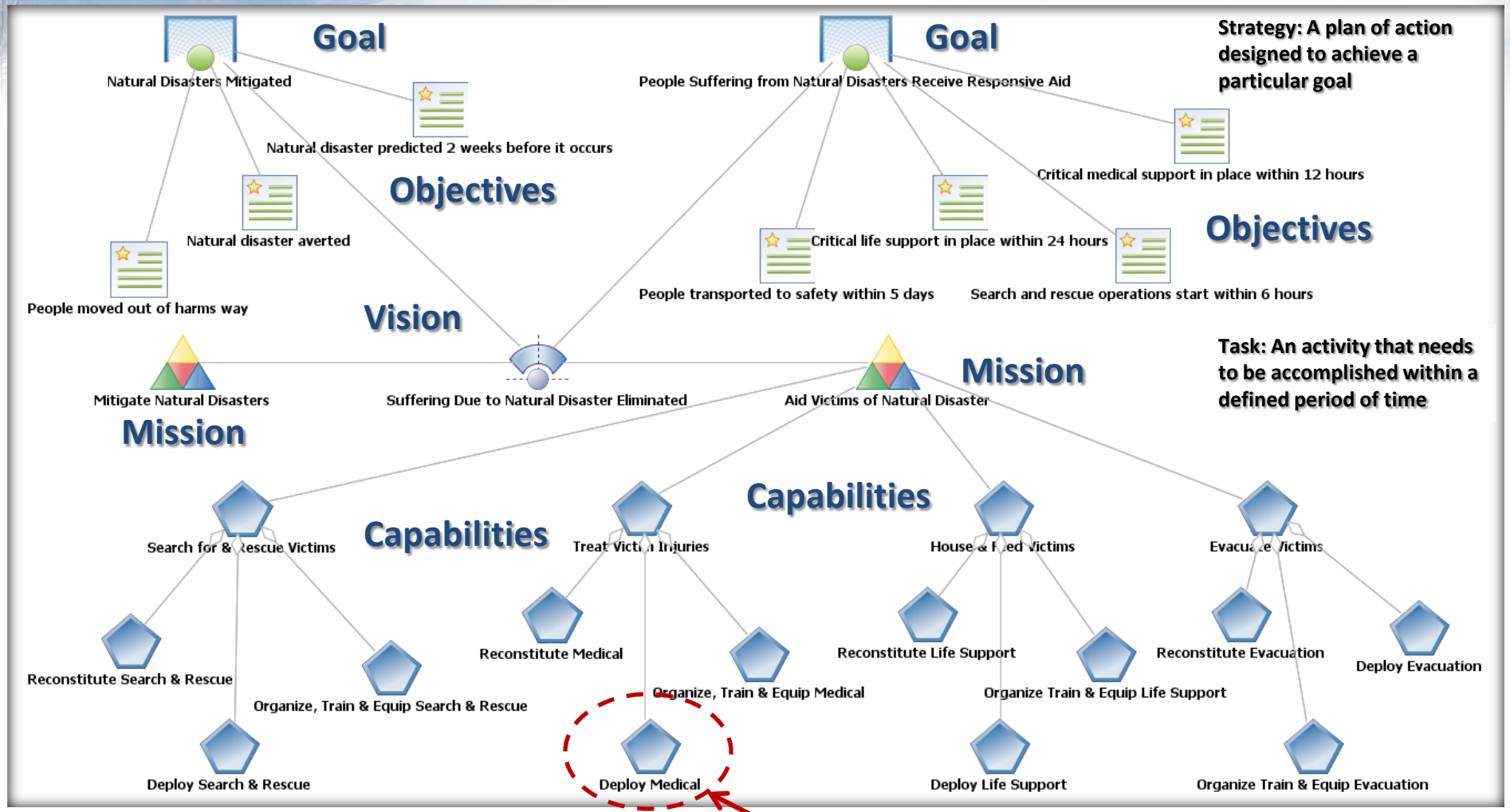
Strategy to Task

Discussion includes the Unified Profile for MODAF and DoDAF (UPDM) using IBM's UML Profile for Integrated Architecture (UPIA)



* Model courtesy of Tom Folk, the MITRE Corporation

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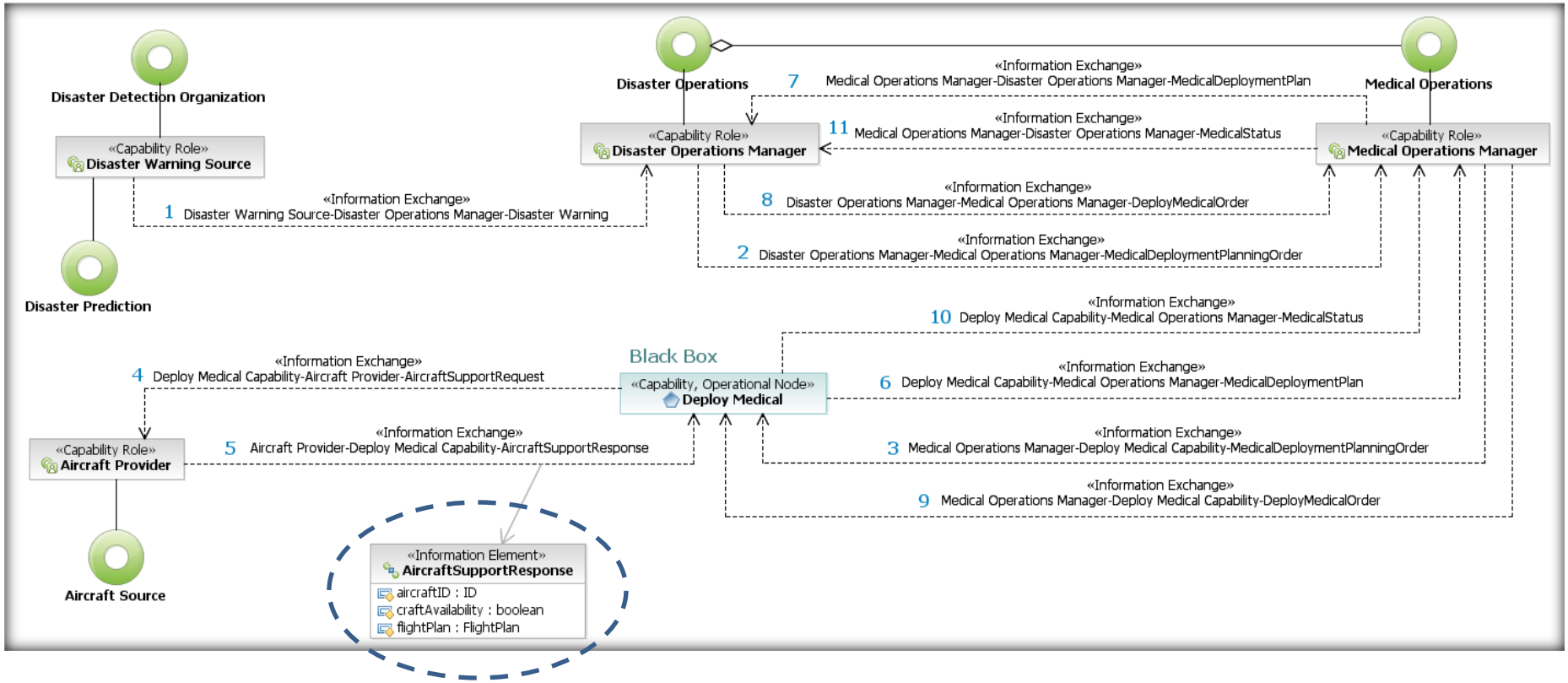
Context Diagram – Information in Context

- Method to think through the process and identify important information elements
- Identifies roles and operational nodes
- Identifies UML use cases (Capability Usage) by recognition of important objects
- Assigns information responsibility to capability



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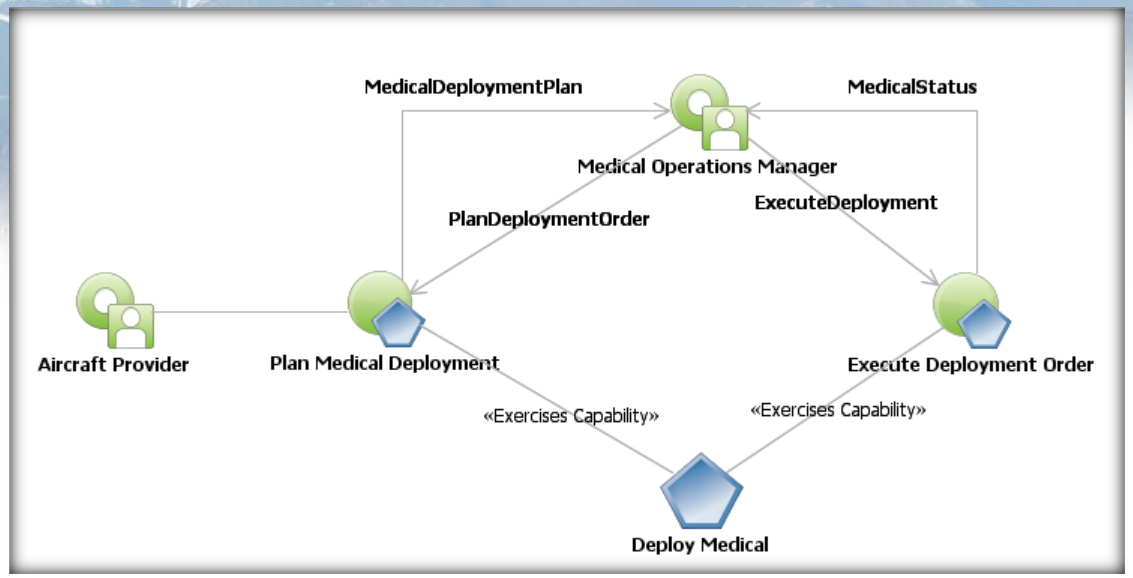
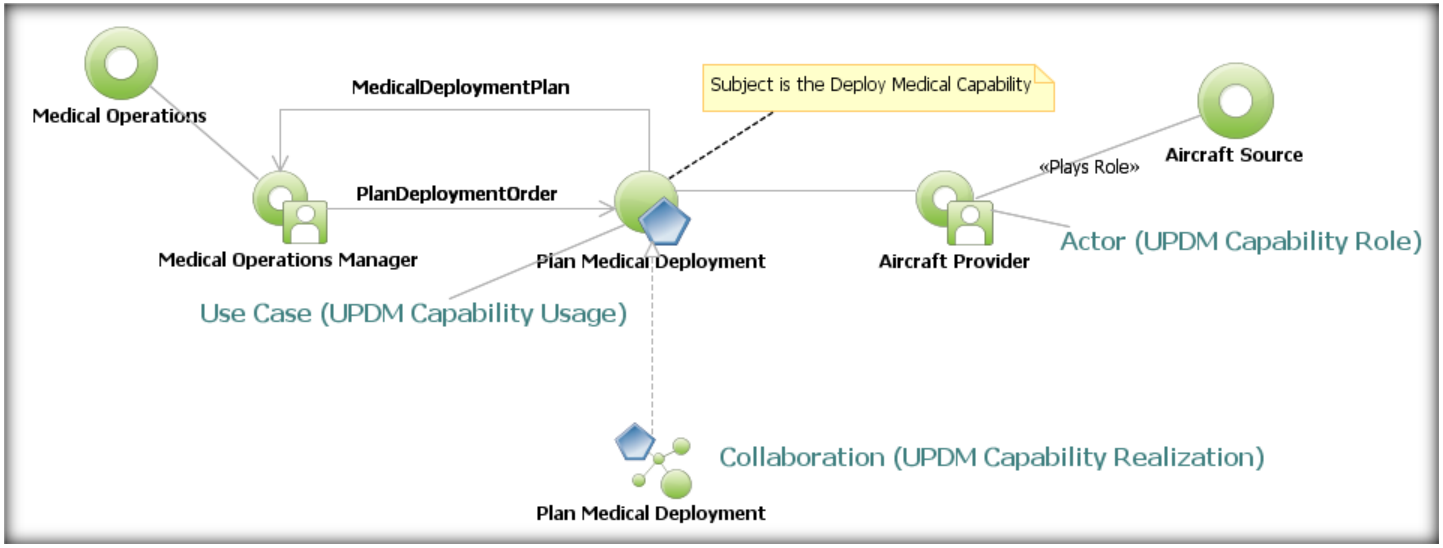
UML Use Cases Exercise Capability



Use Case:

- Defines scope
- Evolves operational concept
- Indentifies triggering objects
- Produces value-based objects
- Defines roles and responsibilities
- Packaged for reuse…



* Model courtesy of Tom Folk, the MITRE Corporation

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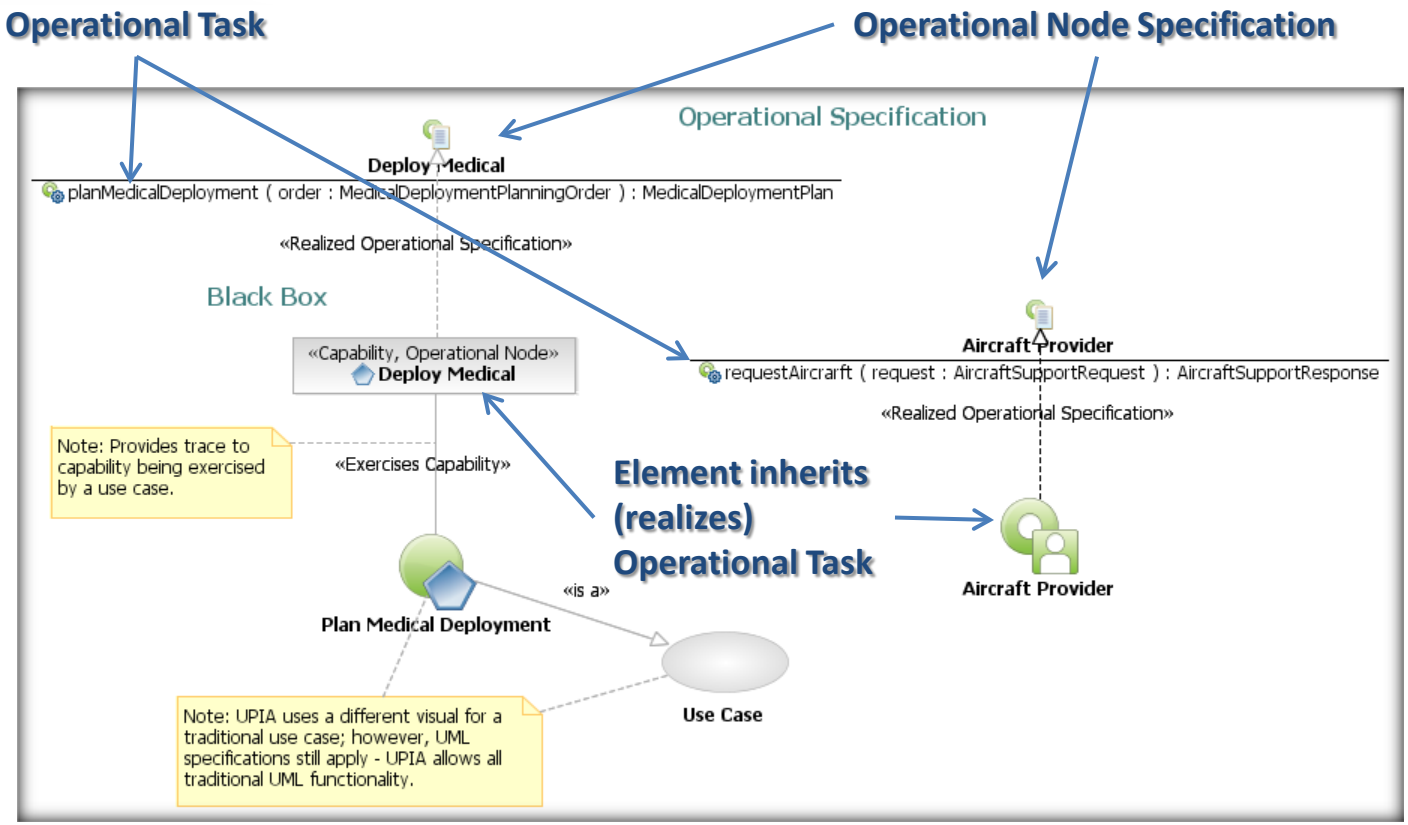
Assign Operational Tasks to Interfaces

Note: The Context Diagram is useful in identifying responsibility of operational tasks i.e., which role owns the task

Interface Realization:

- In UPDM operational interfaces equal Operational Node Specifications
- Binds important objects to Operational Task



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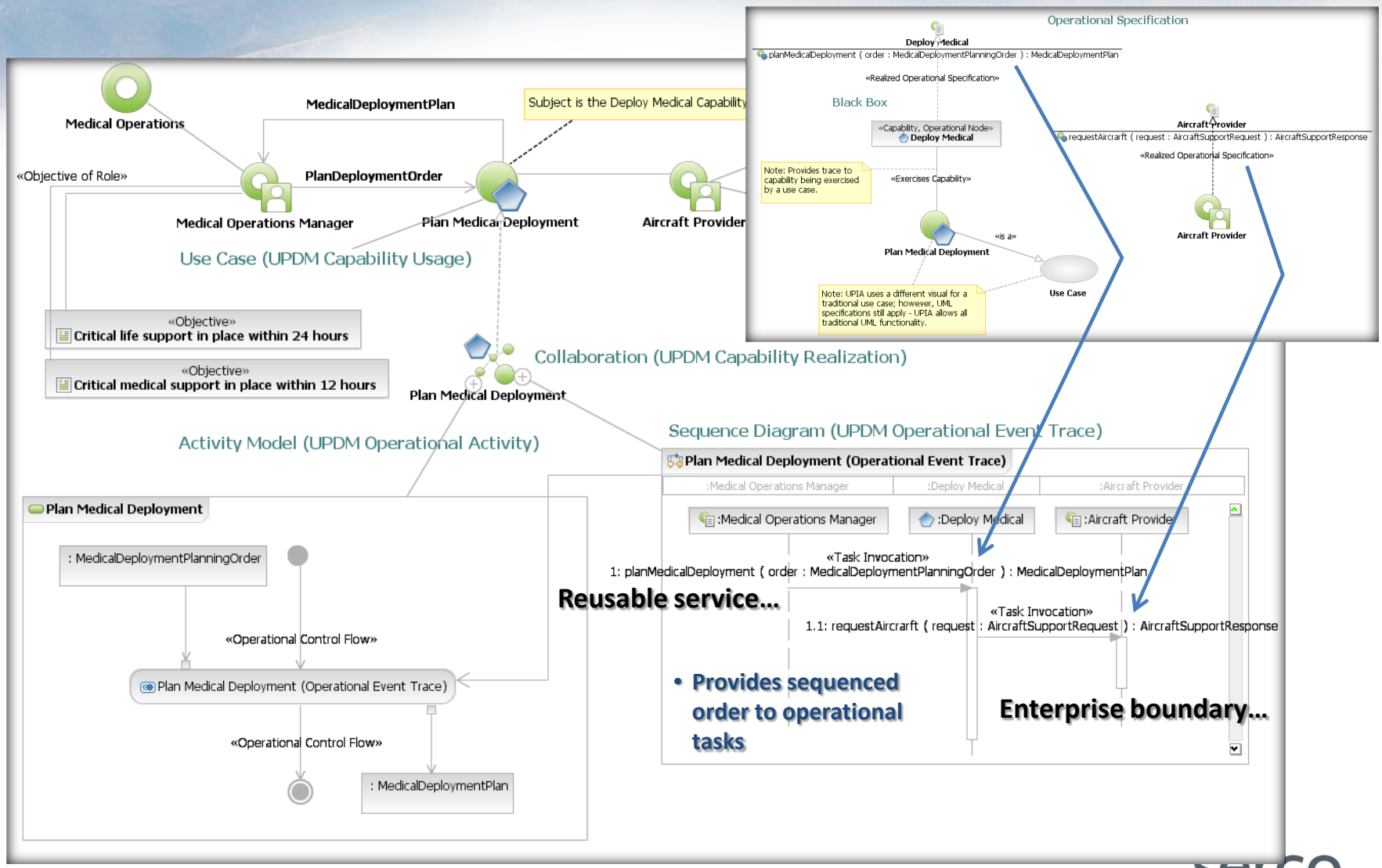
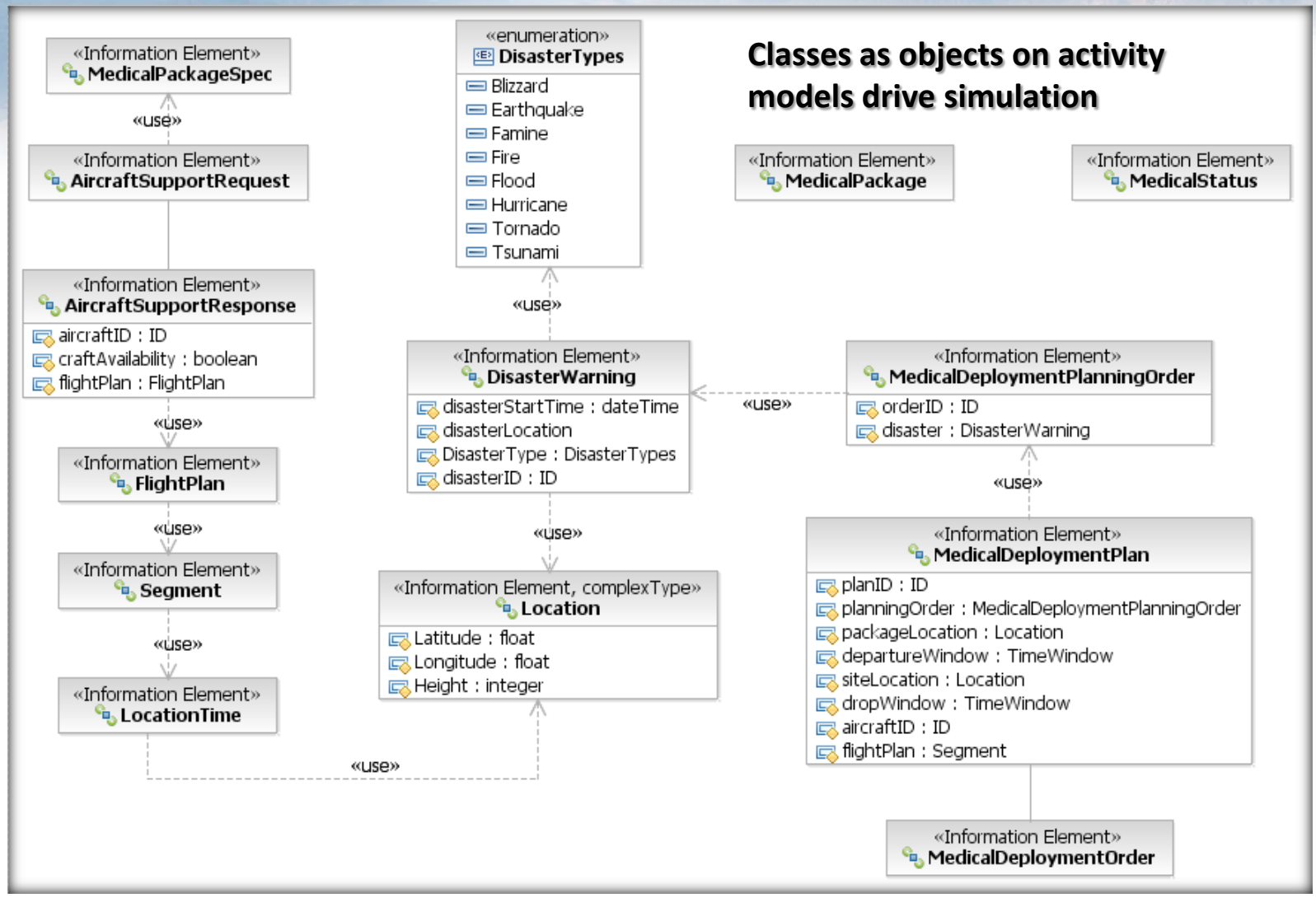
UPDM Capability Realization

- Provides the details of the Capability Usage (UML Use Case)
- Includes Operational Activity and Operational Event Trace



* Model courtesy of Tom Folk, the MITRE Corporation

Provides Logical Data Model Framework



*** Model courtesy of Tom Folk, the MITRE Corporation**

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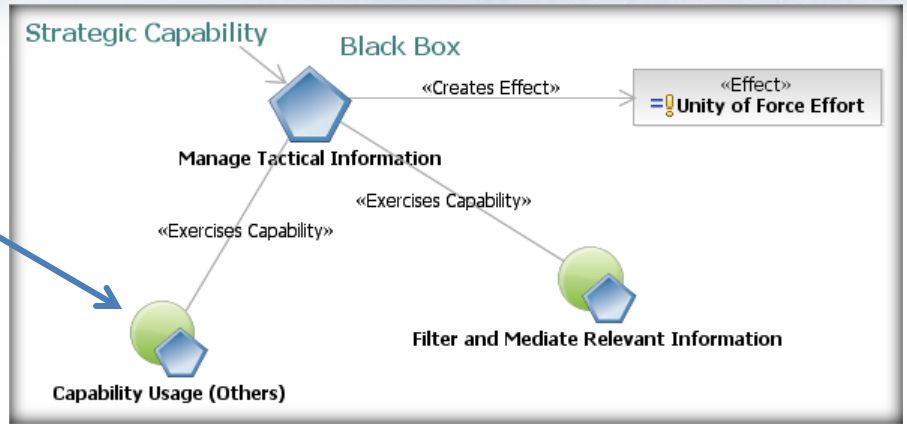
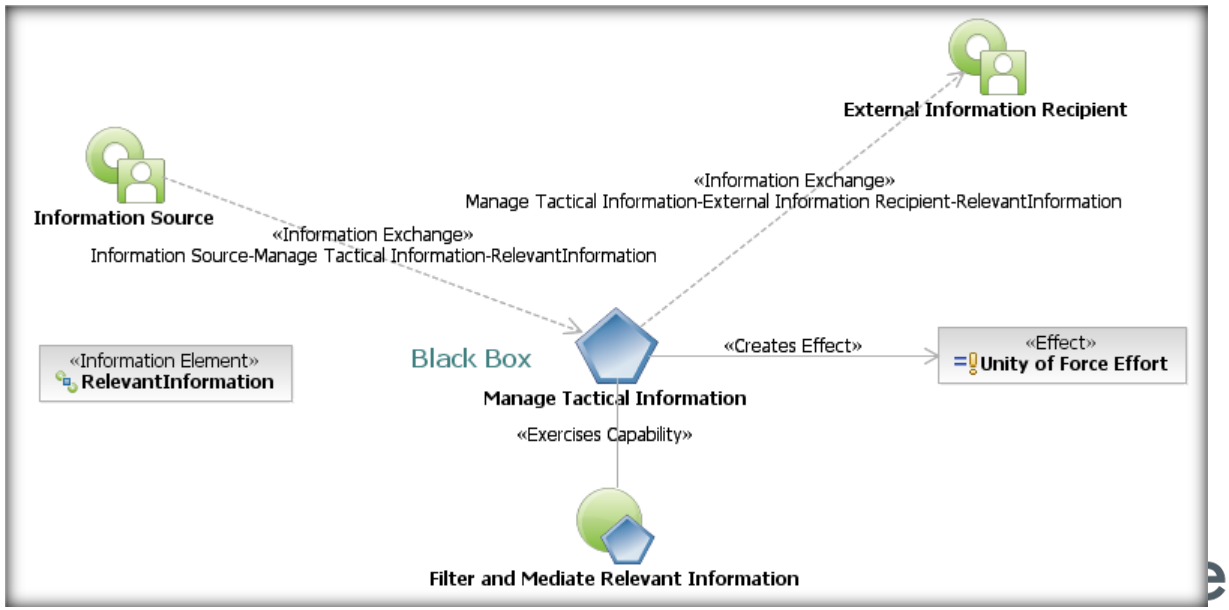
Another Example…

Note: Capabilities may require one to many Capability Usages to produce the desired effect

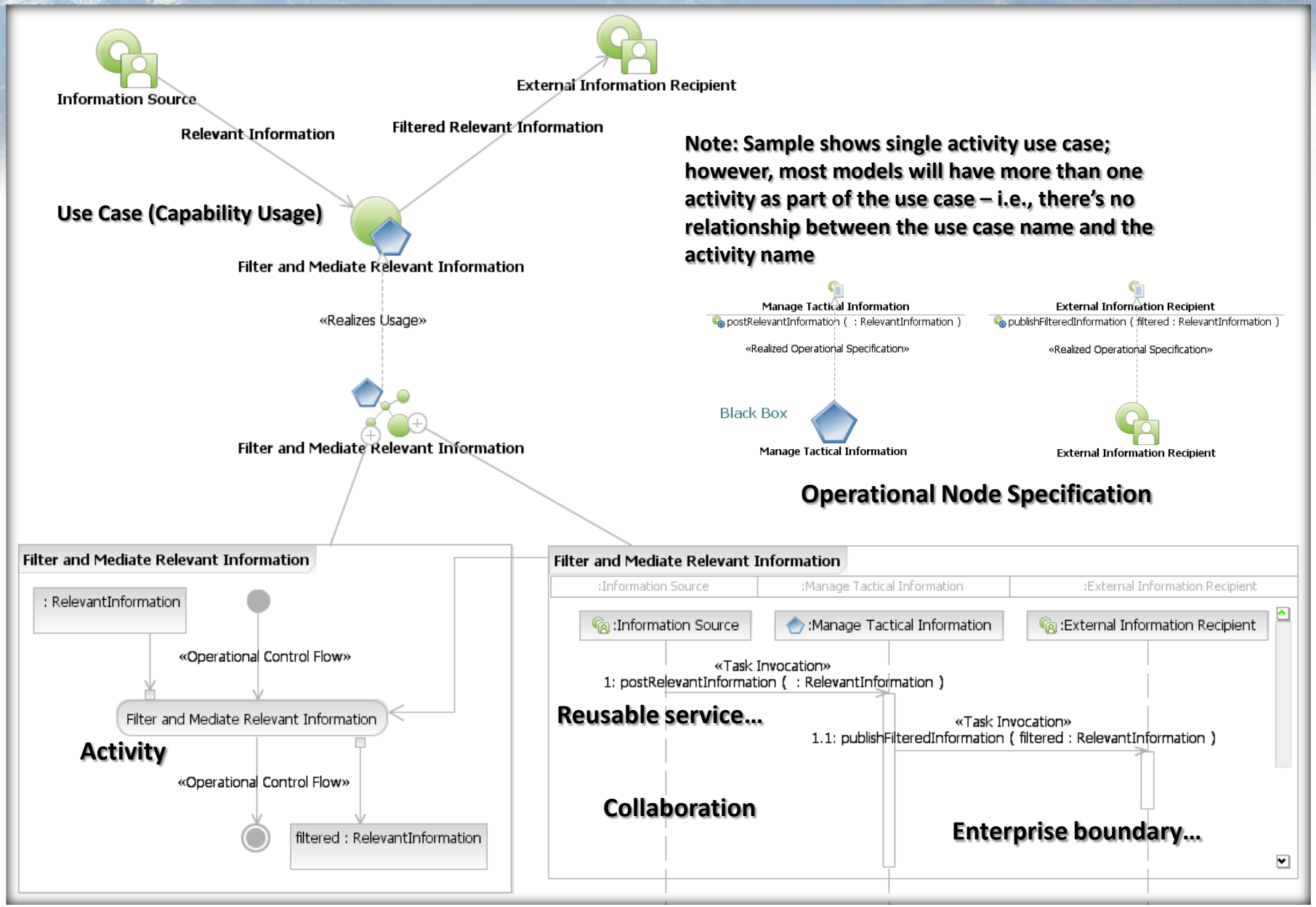
Capability View



Context Diagram

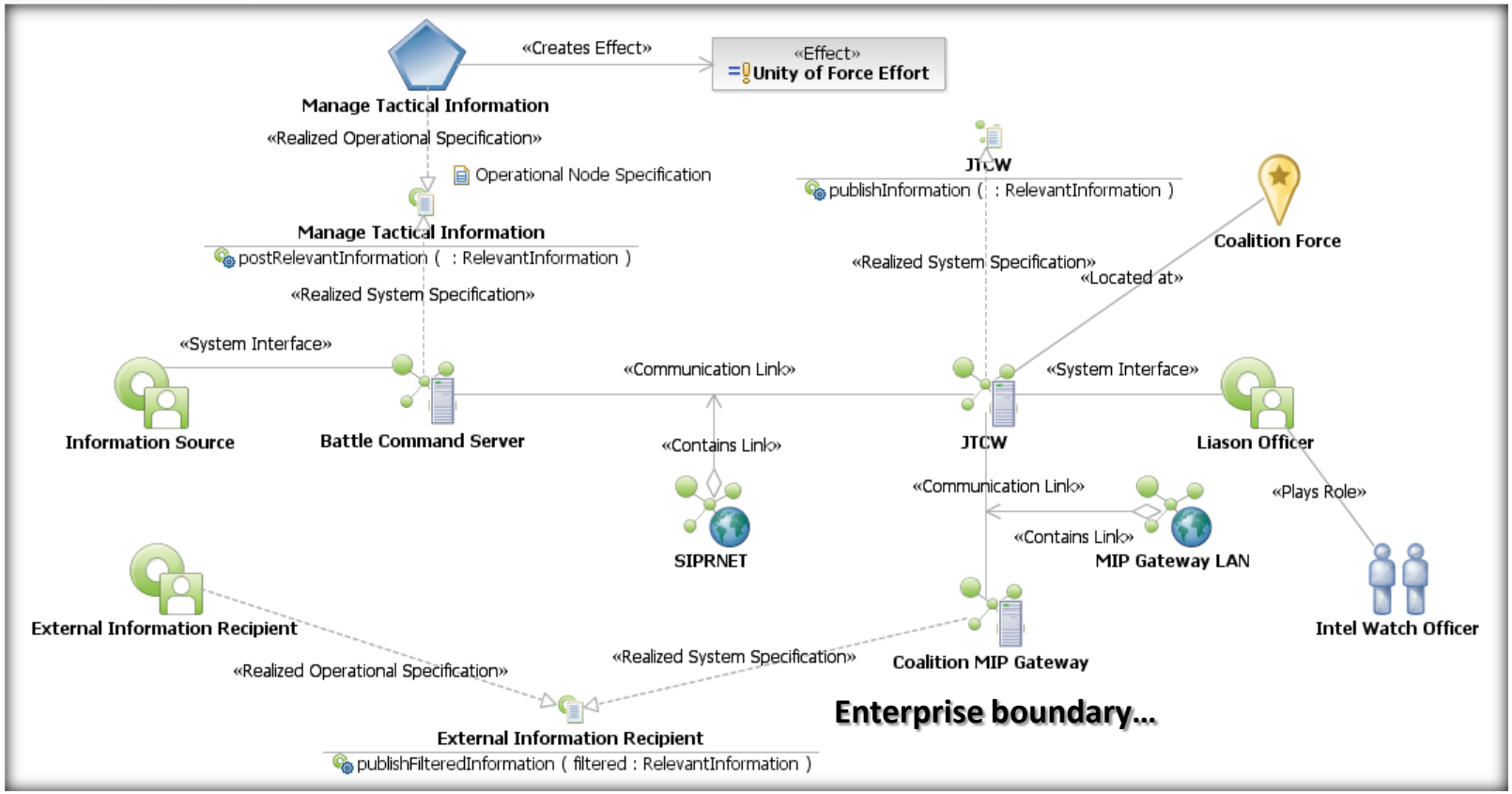


Use Case Model



System View…

- Describes infrastructure elements such as communications links, locations, etc.
- Identifies system interface specifications
- Introduces new roles necessary to implement the capability



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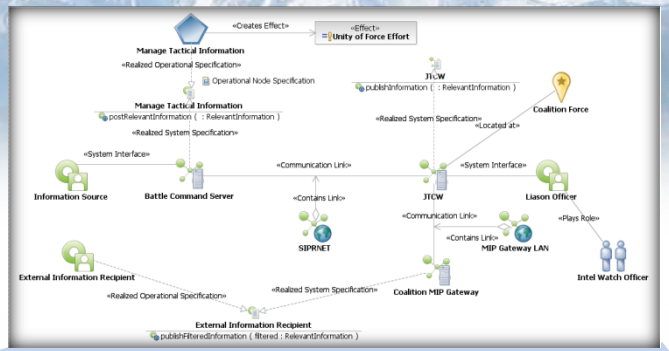
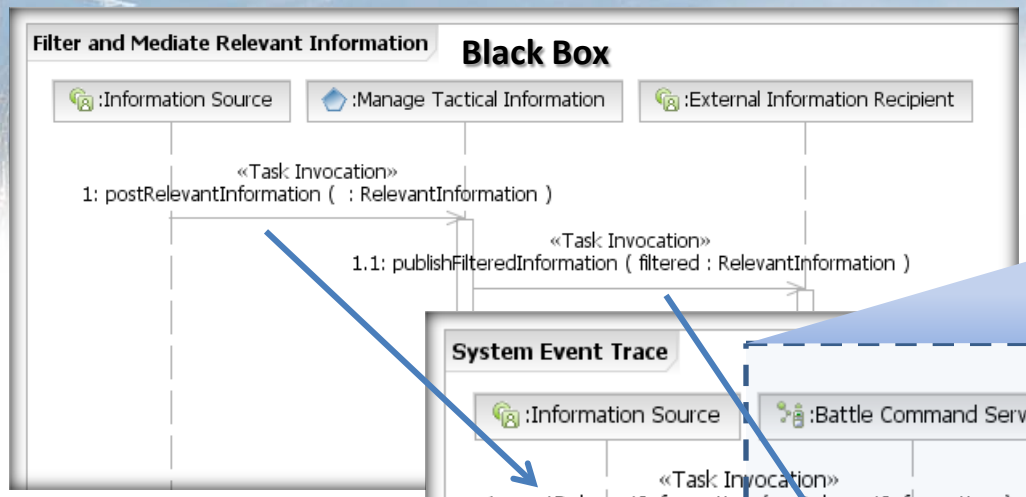
System Event Trace





White Box

System Event Trace

:Information Source | :Battle Command Server | :JTCW | :Liason Officer | :Coalition MIP Gateway

«Task Invocation»
1: postRelevantInformation (: RelevantInformation)

Reusable service...

1.1: postProcessUpdate ( )

1.2: implementSubscriptionPolicy ( )

«Task Invocation»
1.3: publishInformation (: RelevantInformation)

1.3.1: monitorSituation ( )

1.3.2: filterAndMediateInformation ( )

Enterprise boundary...

«Task Invocation»
1.3.3: publishFilteredInformation (filtered : RelevantInformation)

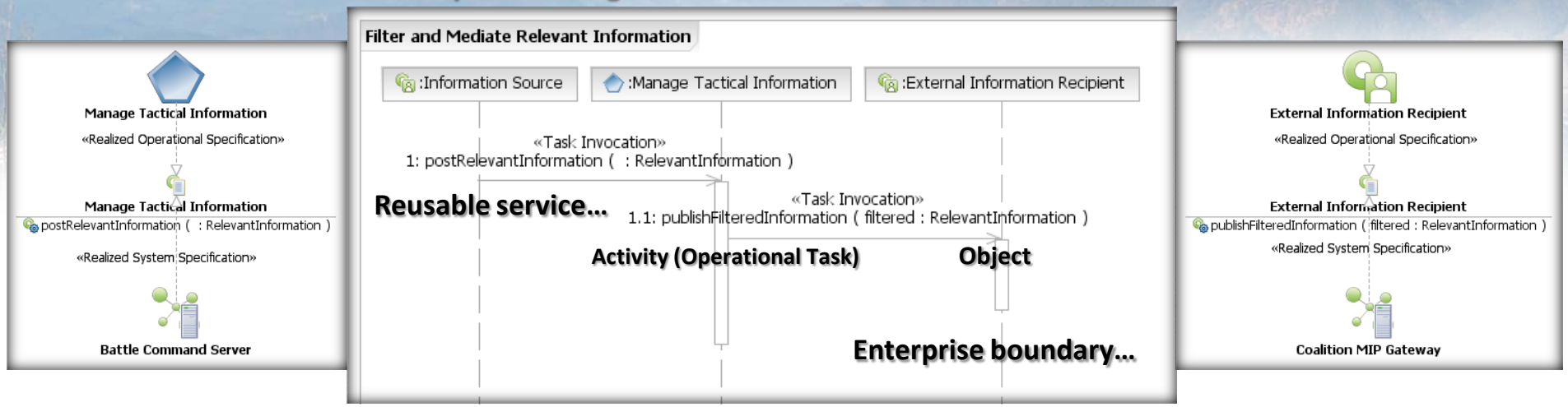
Filter and Mediate Relevant Information CD

Systems Context

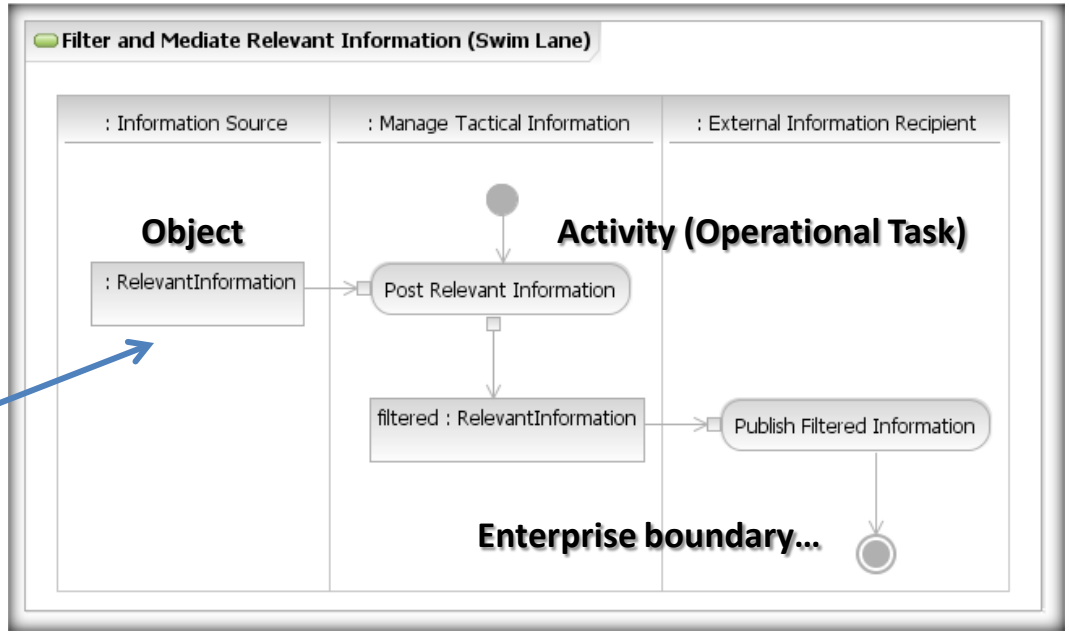
Notice that the edges of the model are the same!

Sequence and Activity Model Comparison

Sequence Diagram



Activity Diagram (Swim Lane)



Sequence Diagram

- Provides traceable interface to system
- Allows management of important interfaces
- Provides a way to establish service agreements between interested participants

Note: Action step implied at start

Activity Diagram

- Interfaces are implied
- More easily understood by non architects
- Provides best framework for animated simulations
- Demonstrates objects moving through process

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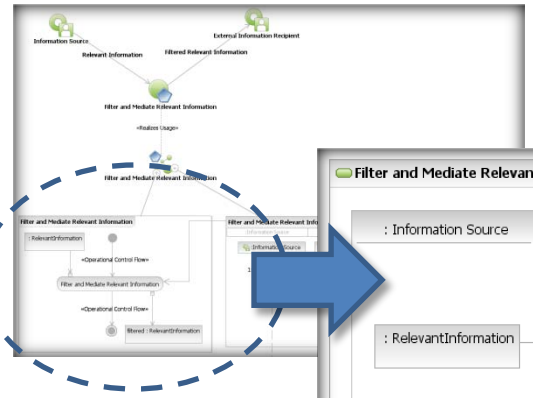
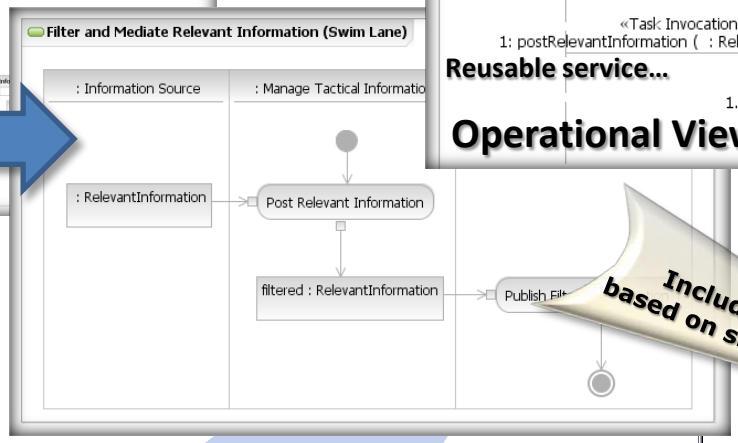
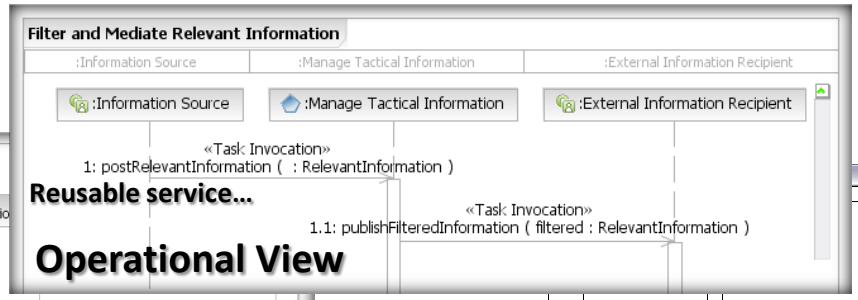


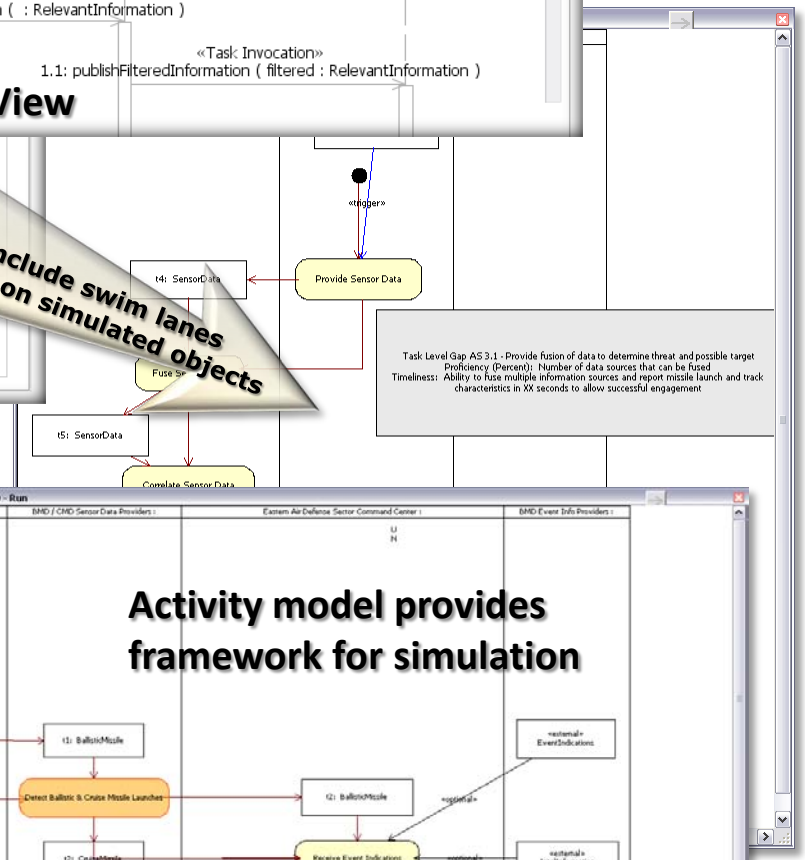




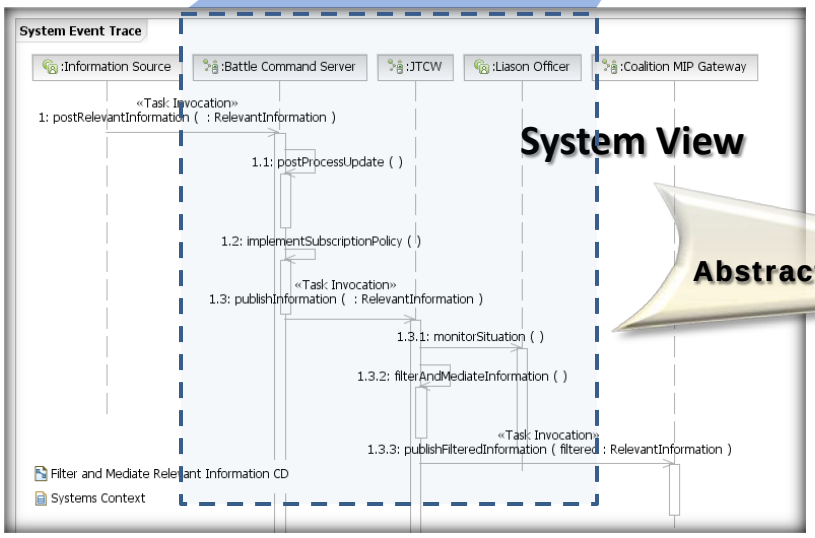
Reusable service…

Operational View

Include swim lanes based on simulated objects

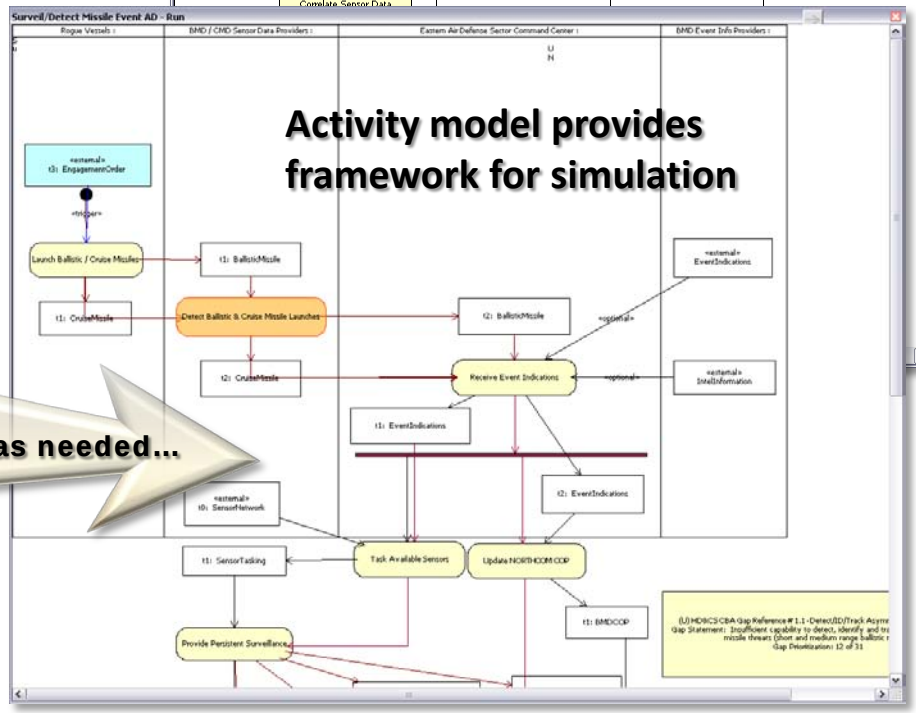


- Activities are containers for modeled behavior
- Represent underlying services realized by systems
- Object flow can be simulated



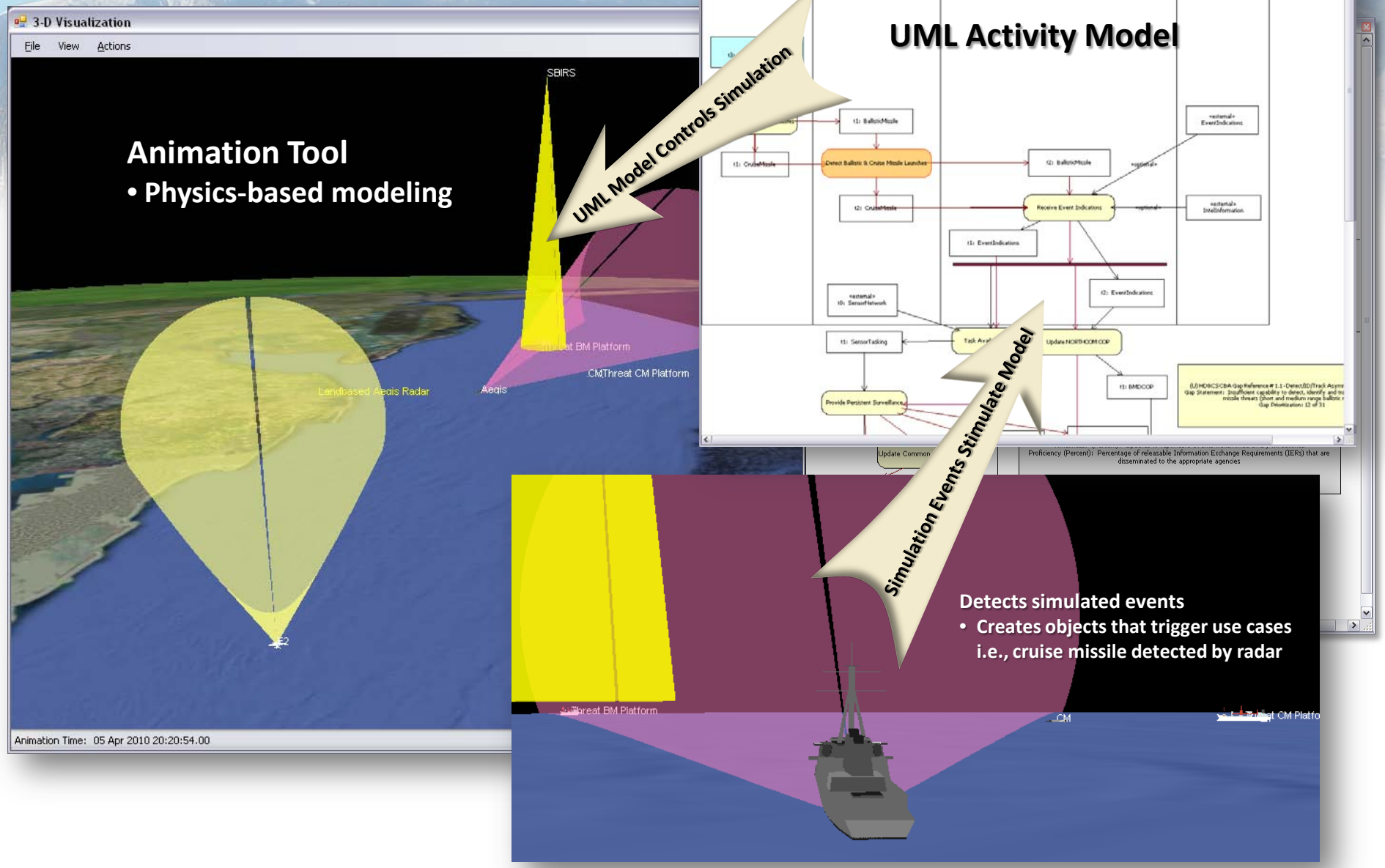
System View

Abstract as needed…



Activity model provides framework for simulation

Model Driven Simulation



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Summary…

- Validates and verifies architecture operational concept with stakeholders
- Understood by leadership and the non architect
- Develops reusable information and services in context of use
- Basis for trade studies based on system implementation considerations
- Provides framework for gap analysis and performance considerations
- Fully traceable to national military strategy
- Provides leadership with an architecture to manage technical portfolio

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