



# Information Assurance For Enterprise Engineering (IAFEE)

Jody Heaney

703.983.5837 • [heaney@mitre.org](mailto:heaney@mitre.org)

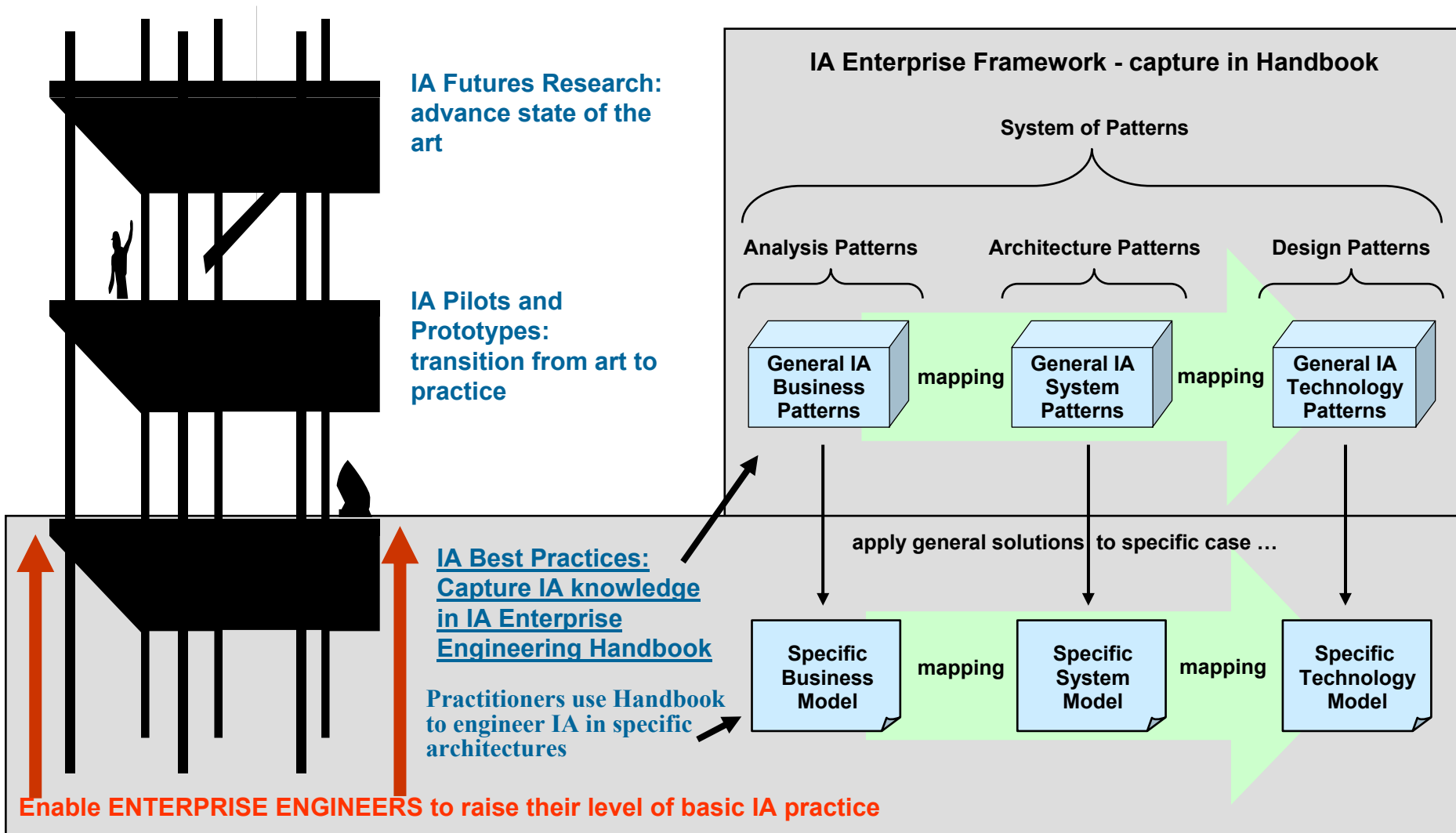
MITRE Sponsored Research

**MITRE**  
**Technology**  
**Program**

# Problem

- **Information Assurance (IA) is a critical National problem**
- **Enterprise Frameworks and Architectures (EAs) are to be used to manage IT and IT investments (Clinger-Cohen and OMB A-130)**
- **Today, IA not effectively included in Frameworks and EAs, and not well integrated into system architectures or designs**

# Background



# MSR Objective

- **Capture common IA solutions adequately and completely across full range of enterprise engineering views and perspectives**
  - Address full spectrum from high-level concepts to lower level instantiations (*adequacy*)
  - Define IA solutions across all enterprise and system perspectives (*completeness*)
  - Make solutions available in an architect's representation (*accessibility*)
- **Integrate solutions in an *IA Enterprise Engineering Handbook* to guide engineering practitioners**

# Activities

## ■ Activities to date:

- (1) Taxonomy of solution areas for IA
- (2) Pattern research for any existing patterns that relate to IA
- (3) Development of pattern templates for IA
- (4) Development of draft overlay view as an IA plane for the Zachman Framework
- (5) Exploration and capture of identification and authentication (I&A) details with two draft patterns

## ■ Future Activities:

- (6) Refine the IA plane to ensure separation and integration of the IA view
- (7) Provide patterns for other IA solution areas (e.g., Access Control)
- (8) A System Case Study: Applying candidate perspectives to an existing MITRE effort
- (9) Prepare an *IA Engineering Handbook*

# Highlight: IA Added to Zachman Framework

The rigor of an Architecture Framework facilitates incorporating IA across the spectrum of system planning and engineering activities.

Zachman Framework* →	Data View	Function View	Network View	People View	Time View	Motivation View	IA View
<b>Scope</b>	List of Things Important to Business 	List of Processes the Business Performs 	List of Locations Important to Business 	List of Organizations Important to Business 	List of Events Significant to Business 	List of Business Goals/Strategies 	
<b>Business Model</b>	Entity=Class of Business Thing e.g., Entity Relationship Diagram 	Function=Class of Business Process e.g., Function Flow Diagram 	Node=Major Business Location e.g., Logistics Network 	Agent=Major Org Unit e.g., Organization Chart 	Time=Major Business Event e.g., Master Schedule 	End/Mean=Major Business Goal/CSF e.g., Business Plan 	
<b>System Model</b>	Ent=Business Entity Rel=Business Rule e.g., Data Model 	Function=Business Process e.g., Data Flow Diagram 	Node=Business Location Link=Business Linkage e.g., Distributed System Architecture 	Agent=Org Unit Work=Work Product e.g., Human Interface Architecture 	Time=Business Event Cycle=Business Cycle e.g., Processing Structure 	End=Business Objectives Means=Business Strategy e.g., Knowledge Architecture 	
<b>Technology Model/ Detailed Representations</b>	Entity=Data Entity Relationship=Data Relationship e.g., Data Design 	Funct=Appl Function Arg=User Views e.g., Structure Chart 	Node=Info Sys Funct Link=Line Char e.g., System Architecture 	Agent=Role Work=Deliverable e.g., Human/Technology Interface 	Time=System Event Cycle=Processing Cycle e.g., Control Structure 	End=Criterion Means=Option e.g., Knowledge Design 	
	Entity=Segment/Row Relationship=Pointer/Key e.g., Data Definition Description 	Funct=Computer Funct Arg=Screen/Device Formats e.g., Program 	Node=Hardware/System Software Link=Line Specification e.g., Network Architecture 	Agent=User Work=Job e.g., Security Architecture 	Time=Execute Cycle=Component Cycle e.g., Timing Definition 	End=Condition Means=Action e.g., Knowledge Definition 	
	Ent=Fields Rel=Addresses	Funct=Language Stmt Arg=Control Blocks	Node=Addresses Link=Protocols	Agent=Identity Work=Transaction	Time=Interrupt Cycle=Machine Cycle	End=Subcondition Means=Step	

# Demonstration: Example Identification and Authentication (I&A) Patterns in Each Model

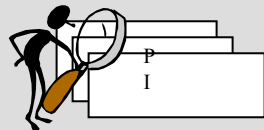
## IA View

S



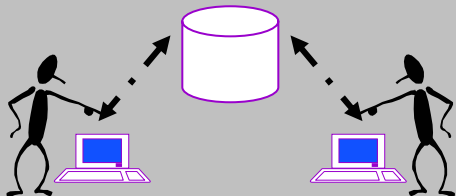
Identify need for individual Identification

B  
M



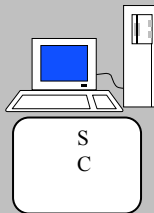
Identify need for authentication

S  
M



Select strategy and protocol constraints for I&A

T  
M  
D  
R



Select type and number of authenticators to support strategy  
Select/implement specific authentication mechanisms of appropriate types

# Impacts

- **Increase ability to address IA in Enterprise Frameworks and Architectures**
  - IA is increasing concern to all customers
  - All customers building or using frameworks
    - **Federal Enterprise Architecture Framework (FEAF)**
    - **DoD/C4ISR Architecture Framework**
- **Help engineers address OMB Circular A-130 requirements with MSR results**
- **Mitigate shortage of skilled IA personnel by providing IA Engineering Handbook**

# Future Plans: Map IA Patterns to Framework, Integrate in Handbook

## Pattern Template

## IA Enterprise Eng. Handbook

- Pattern Name
- Resulting Context
- Problem Addressed
- Examples
- Context/circumstances
- Rationale/Benefits
- Forces/considerations
- Related Patterns
- Solution
- Known Uses



	Data View	Function View	Network View	People View	Time View	Motivation View	IA View
<b>Zachman Framework*</b>	List of Things Important to Business Entity=Class of Business Thing	List of Processes the Business Performs Function=Class of Business Process	List of Locations Important to Business Node=Major Business Location	List of Organizations Important to Business Agent=Major Org Unit	List of Events Significant to Business Time=Major Business Event	List of Business Goals/Strategies End=Means=Major Business Goal/CSF	
<b>Business Model</b>	e.g., Entity Relationship Diagram Ent=Business Entity Rel=Business Rule	e.g., Function Flow Diagram Function=Business Process Arg=User	e.g., Logistics Network Node=Business Location Link=Business Process	e.g., Organization Chart Agent=Org Unit Work=Business Process	e.g., Master Schedule Time=Business Event Cycle=Business Cycle	e.g., Business Plan End=Business Objective Means=Business Strategy	
<b>System Model</b>	e.g., Data Model Entity=Data Entity Relationship=Data Relationship	e.g., Data Flow Diagram Func=Appl Function Arg=User Views	e.g., Distributed System Architecture Node=Hardware System Software Link=Line Specification	e.g., Human Interface Architecture Agent=Role Work=Deliverable	e.g., Processing Structure Time=System Event Cycle=Processing Cycle	e.g., Knowledge Architecture End=Criterion Means=Option	
<b>Technology Model/ Detailed Representations</b>	e.g., Data Design Entity=Segment/Row Relationship=Pointer	e.g., Structure Chart Func=Computer Function Arg=Screen/Device Formats	e.g., System Architecture Node=Hardware System Software Link=Line Specification	e.g., Human Technology Interface Agent=User Work=Deliverable	e.g., Control Structure Time=Execute Cycle=Component Cycle	e.g., Knowledge Design End=Condition Means=Action	
	e.g., Data Definition Description Ent=Fields Rel=Addresses	e.g., Program Func=Language Statements Arg=Control Blocks	e.g., Network Architecture Node=Addresses Link=Protocols	e.g., Security Architecture Agent=Identity Work=Transaction	e.g., Timing Definition Time=Interval Cycle=Machine Cycle	e.g., Knowledge Definition End=Subcondition Means=Step	

\* Zachman Institute for Framework Advancement

Copyright - John A. Zachman, Zachman International

