



**Enterprise
Architecture:
Enabling
Enterprise
Strategic
Performance**

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Vision

- Enterprise architecture (EA) and strategic enterprise performance
- Analytic Hierarchy Process (AHP)
- Chief Enterprise Architect Criteria Definition Activity
- Reflections
- Summary



The Enterprise

“an enterprise is any collection of organizations that has a common set of goals and/or a single bottom line. An enterprise, by that definition, can encompass a Military Department, DoD as a whole, a division within an organization, an organization in a single location, or a chain of geographically distant organizations linked by a common management or purpose.” (DoD, 2009)



United States Office of Management and Budget (OMB) EA Definition



- An EA describes the current and future state of the agency, and lays out a plan for transitioning from the current state to the desired future state. An EA is a management practice for aligning resources to improve business performance and help agencies better execute their core missions. (OMB, 2007)

Plan Plan Plan	Decision Decision Decision
Action Action Action	Outcome Outcome Outcome



EA Benefits and Expected Outcomes



Planning

**Decision-
Making**

**Business
Process
Execution
Optimization**

**Enterprise
Performance
Effectiveness
and Efficiency**



Architecture Descriptions

Enterprise Architecture: An EA describes the current and future state of the agency, and lays out a plan for transitioning from the current state to the desired future state (OMB, 2007).

Segment Architecture: Segments are individual elements of the enterprise that describe core mission areas, common or shared business services, and enterprise services (OMB, 2007).

Solution Architecture: The solution architecture describes all major activities that are associated with an identified solution for a capability gap in response to a specific requirement (DoD, 2009).

Architectural Hierarchy

Level	Scope	Detail	Impact	Audience
Enterprise Architecture	Agency/ Organization	Low	Strategic Outcomes	All Stakeholders
Segment Architecture	Line of Business	Medium	Business Outcomes	Business Owners
Solution Architecture	Function/ Process	High	Operational Outcomes	Users and Developers

OMB, 2007

EA Describes Six Critical Dimensions

Who

2. What

(Mission/Business Activities)

3. How
(Solutions)



When

1. Why
(Performance Goals)

Where

Current Capabilities

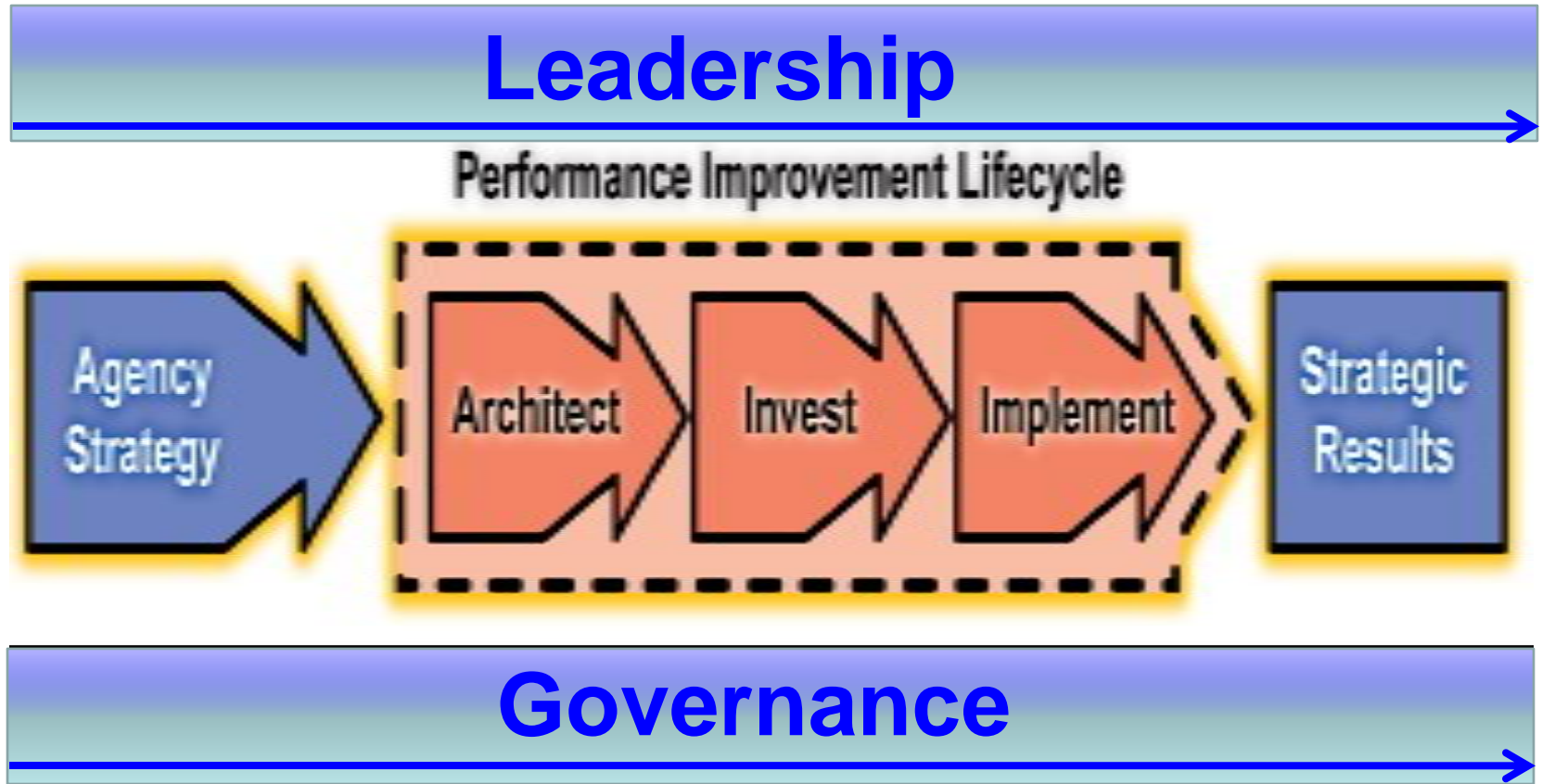


Time

Desired Capabilities



EA in Context





EA in Action

NMCI

DFAS

DTS

DIMHRS

Grants.GOV

NextGen

usajobs.GOV

E-Travel

NGEN





U.S. Army EA Opportunity

“The 2010 Army Modernization Strategy (AMS) defines how the U.S. Army continues to modernize and transform to fulfill our mission to sustain our Soldiers and maintain readiness of the world’s strongest, and most capable Army. It describes our efforts to ensure that Soldiers have the best equipment and necessary capabilities to guarantee their success in any mission or environment. The strategy is designed to describe our overarching goals, priorities, and objectives to both internal and external audiences so that we can achieve unity of purpose in our modernization efforts.” (U.S. Army, 2010)



Intelligence Community EA Opportunity

Section 322. Intelligence Community business system transformation

“A business enterprise architecture incorporates an agency’s financial, personnel, procurement, acquisition, logistics, and planning systems into one interoperable system. Historically, Intelligence Community elements have pursued unique, stovepiped systems that do not leverage the investments of other elements of the Intelligence Community. More recently there has been a more collaborative effort among the Intelligence Community elements on the development of business systems, but true transformation to an integrated Intelligence Community architecture has not been achieved.” (U.S. Senate, 2009)

Note: Proposed legislation yet to be enacted.



Multi-Criteria Decision Making

Analytic Hierarchy Process (AHP)

*“Most of us lack the ability-and the desire-to make sophisticated cost-benefit calculations. Instead of insisting on finding the best possible decision, we will often accept one that seems good enough. And we often let emotion affect our judgment. Yet despite all these limitations, when our imperfect judgments are **aggregated in the right way**, our collective intelligence is often excellent.”* *The Wisdom of Crowds*, James Surowiecki – pg xiv.



- **Analytic Decision Making Challenges**
- **Introduction to the Analytic Hierarchy Process (AHP)**
- **AHP Applications in Enterprise Architecture Development and Management**
- **Workshop Team Assignment**



➤ Two Types of MCDM:

- multiple criteria discrete alternative problems (finite set of alternatives)
- multiple criteria optimization problems (infinite set of alternatives)

➤ Over 20 MCDM Techniques

➤ Predominate Techniques*:

- **Analytic Hierarchy Process (AHP) & Fuzzy AHP**
 - **Analytic Network Process (ANP) & Fuzzy ANP (recent circa 2005)**
- Pros and Cons
- Kepner-Tregoe (K-T) Decision Analysis
- Multi-Attribute Utility Theory (MAUT)
- Cost -Benefit Analysis
- Custom tailored tools

* Source – *Guidebook to Decision-Making*, 2001

Diverse Applications of AHP

- Conflict Resolution
- Contingency Planning
- Portfolio Selection
- Energy Allocation
- Technology Selections
- Terrorism Assessment
- HR Performance Evaluation
- Facility Location Selection
- Supporting other techniques such as the Balanced Score Card & SWOT
- Etc.....

History

- **Founder**
 - Thomas Saaty
- **Issue - assigning value to qualitative concepts and subjective decisions in complex environments**

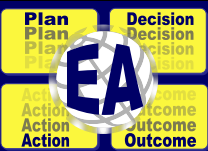


The old adage that one cannot compare apples to oranges is false. Thomas Saaty

- **Primary use of AHP is the resolution of choice problems in multi-criteria environments**

- **Weighted criteria alternatives or product selection**
 - Arguing over the weighted criteria when the selection is contested
 - Establishing weights and criteria for complex problems
 - Does not account for criteria interaction (*i.e.*, complementarities)
 - What is the right scale (*what is the just noticeable difference between 7 & 8 on a 10 pt scale?*)
- **Cost/Benefit Analysis (CBA) and Return on Investment (ROI)**
 - Quantifying intangibles (*i.e.*, noneconomic factors) for strategic alternatives (micro-economic techniques not macro-economics)
 - Leads to less-riskier alternatives or rejecting higher risk projects
- **Achieving Consensus or a Decision**
 - With polarized view points
 - With “large” (> 20) participants/populations
- **Defensibility of Decision**
 - Nominal group techniques - reproducibility/consistency
 - Testable
 - Believable

Federal Agency IT Portfolio Hierarchy & Priorities

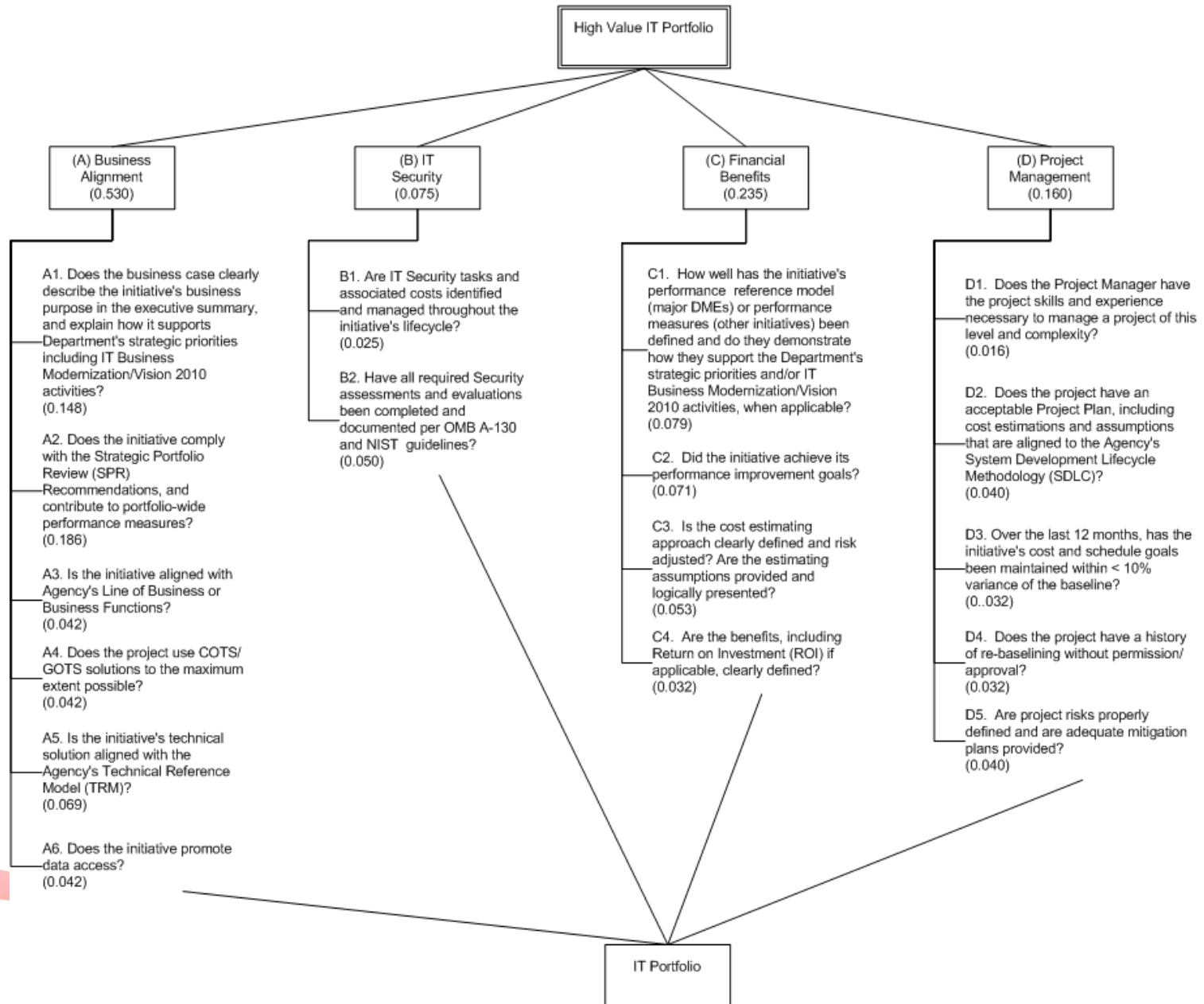


Level 1:
Goal

Level 2:
Criteria

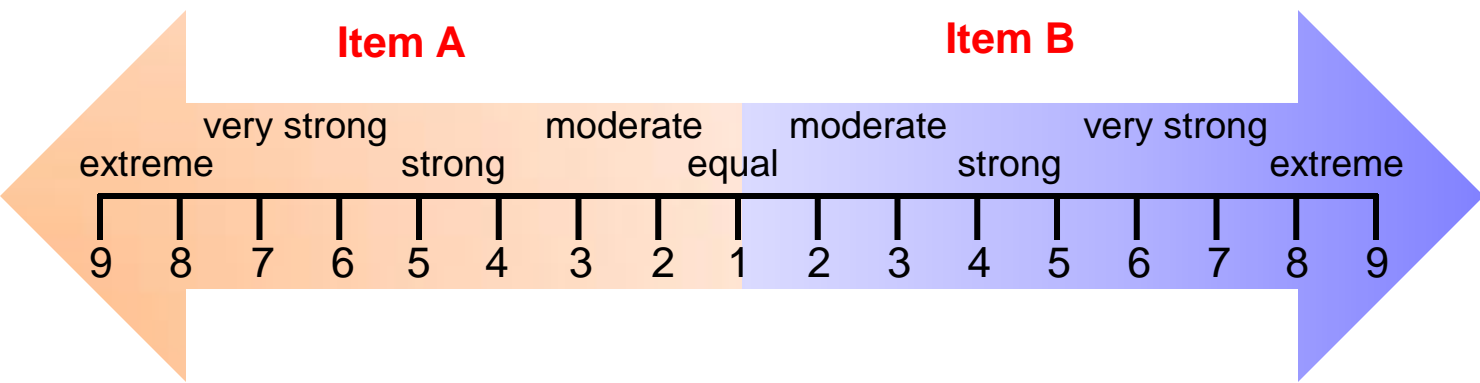
Level 3:
Subcriteria

Level 4:
Composite
IT Portfolio



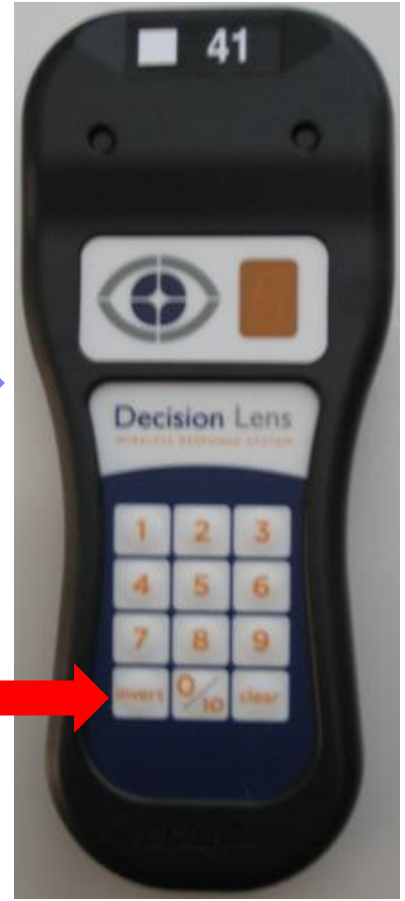
Priority Scale

Default is A is <something more> than B



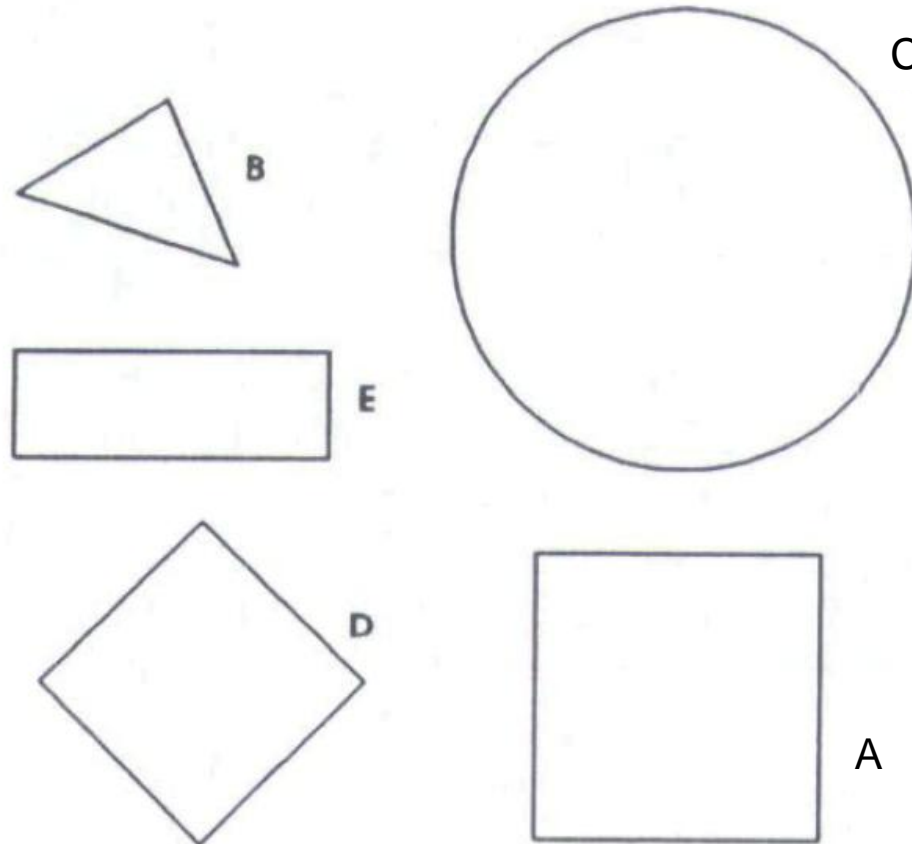
Press "Invert" to change to B is <something more> than A

"Hand-Mind Coordination Test" →





➤ Determine the relative area for three figures: A, B & C (only)

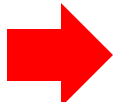


Source: How to Make a Decision: The Analytic Hierarchy Process, Saaty, T. *Interfaces*, pg 42

➤ Compare results to know surface area

EA Lifecycle Process*



- 
 - Selecting staff based on desired competency criteria
 - Selecting EA tools, methodologies, techniques, technologies etc.
 - Selecting Scope or focus of EA project
 - Determining Processes, Capabilities, Data Entities etc
 - Selecting alternative target states
 - IT Portfolio selection
 - Etc...



* Stylized of course



“Chief Architect Competency Framework”

- **Solution and Enterprise Architecture is an emerging discipline, and we are still learning what it takes to be an effective architect**
 - Building on the Clinger-Cohen CIO Competencies, OPM and the Federal CIO Council's Workforce Subcommittee have defined job attributes for architects within the Information Technology Management Job Family; the initial version was issued in 2001, and the most recent update is from 2008
 - In 2008 DoD published a white paper discussing architect competencies required to meet DoD-specific needs
- **The OSD CIO Architecture Directorate made a formal request to the IAC EA SIG, an open group of companies that supports the Federal CIO Council, for assistance in developing an Architect's Competency Framework in October 2009**
- **The IAC EA SIG has worked closely with OSD CIO to develop this draft framework, which incorporates feedback from the DoD architecture community, companies, and universities**



- **Map Architecture activities/outcomes to competencies to required knowledge, skills, and abilities (KSAs) and KSAs to training and other support tools for use by**
 - Employees, in both the IT Management and other OPM job series
 - Supervisors
 - Hiring Managers/HR Specialists
 - Program Managers
 - Education/Training Providers
- **Test and refine the mappings with the help of EA practitioners and the academic community**



- **Employee – someone who is performing or considering an EA job**
- **Supervisor – someone who supervises an EA practitioner**
- **Hiring Manager/HR Specialist – someone responsible for filling a position for an EA job**
- **Program Manager – someone writing a statement of work for an acquisition that includes EA activities**
- **Education/training provider - someone who creates and delivers offerings to help an employee acquire KSAs that support his or her professional objectives**

Competency Framework Uses and Benefits



- **Career planning – reduces time and effort for employee by organizing information about architecture-related activities, jobs, job families, training, and experience**
- **Appraisal – reduces time and effort for supervisor and employee by clarifying expectations**
- **Hiring – reduces time and effort for hiring manager and HR specialist in specifying KSAs for new job descriptions**
- **Contracting– reduces time and effort for program manager in specifying architecture activities and KSAs for new acquisitions**
- **Education/training - reduces time and effort to develop a instructional program for architects**



- **The draft Architect’s Competency Framework is organized in 5 groups, each of which includes from 1 to 6 individual competencies.**
- **The competency groups build from universal competencies to competencies that are specific to a function, profession, and organization**
- **Each competency consists of 5 levels of activity.**
- **Reading from left to right, the activities range from beginner to expert performance.**
- **Each activity is associated with a set of Knowledge, Skills, and Abilities (KSAs) required to perform that activity.**





Description of Competency Groups

- **Individual: competencies, activities, and KSAs required for a person to complete tasks successfully working on his or her own.**
- **Interpersonal: competencies, activities, and KSAs required for a person to complete tasks successfully working with others**
- **Technology: competencies, activities, and KSAs required for a person to complete tasks widely carried out by technology organizations.**
- **Architecture: competencies, activities, and KSAs required for a person to complete solutions and enterprise architecture tasks**
- **DoD-Specific: competencies, activities, and KSAs required for a person to complete solutions and enterprise architecture tasks within DoD**

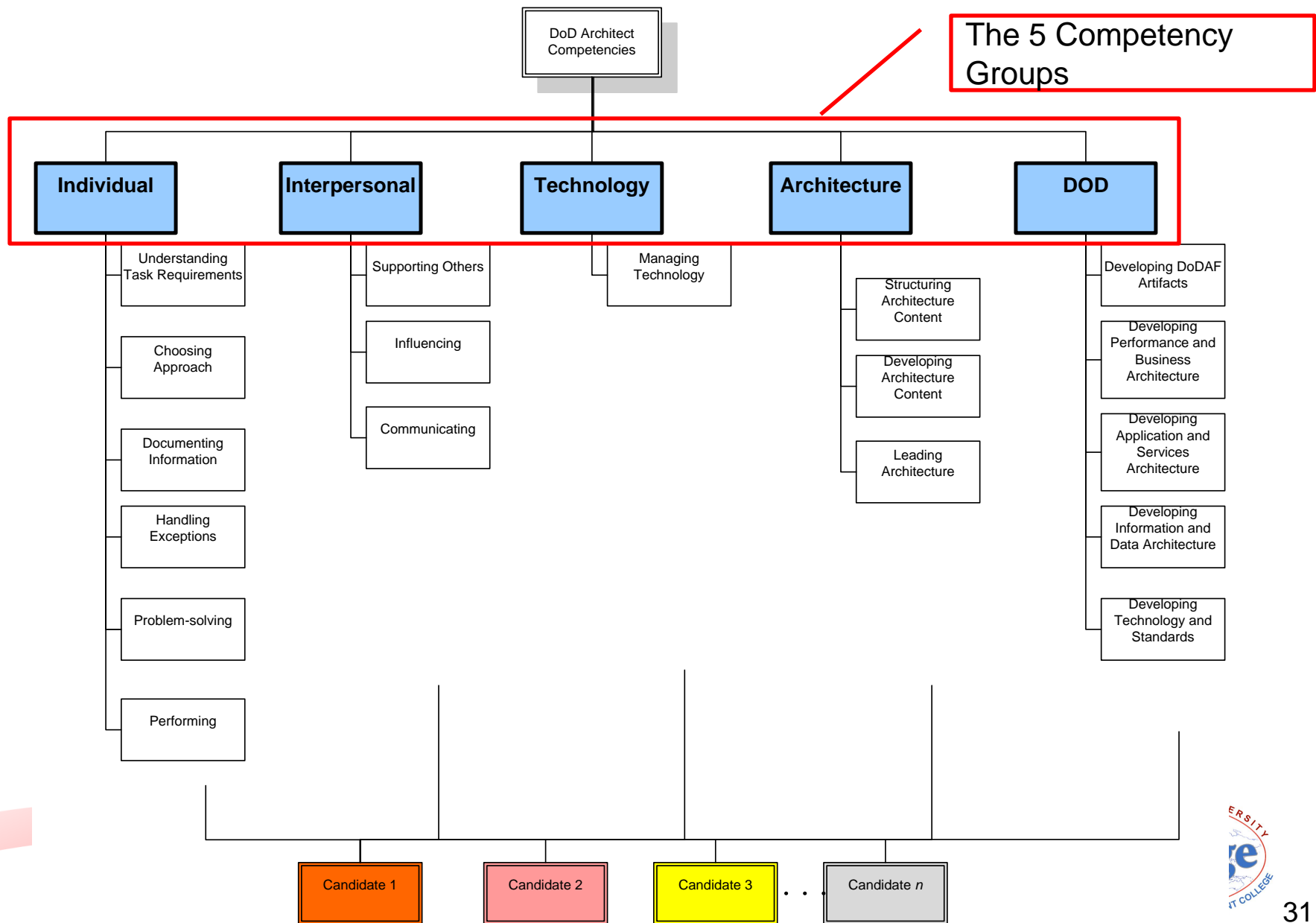




Exercise: To prioritize the Chief Architect Competencies

- **Your organization is a DoD entity that has been underperforming for some time. There have been three political appointees in as many years. The organization is experience significant infighting with programs implementing local solutions, resulting in ineffective and inefficient processes and stove-piped outdated legacy systems. DoD senior leadership is expecting improved performance under the organization’s newly appointed leader. Also, GAO and OMB have strongly criticized the organization for its underperformance and have stated this in part due to a lack of an EA Program to identify and guide improvements as well as a lack of a Chief Architect to support the senior leadership.**
- **Your team has been tasked to select the Chief Architect for your agency. You have been provided a set of architect competencies. Your fist step in developing the job description is to prioritize the competencies. Due to the organizational climate, the architect selection must be transparent and resistant to political pressures. Based on your prior experience you have proposed to use the Analytic Hierarchy Process.**

Chief Architect Competencies





Questions, Observations, Comments

