Enterprise Architecture and COTS-Intensive System Acquisition Strategies

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Topics

- The Challenge: Modern system acquisition forces and their implications
- An Approach: EPIC - A modern process for reconciling COTS product approaches with the architecture-based acquisition
- Strategies: Representative approaches and issues
- Summary

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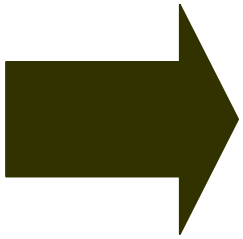
Modern System Acquisition Forces and Their Implications

Forces

- **Keep pace with changing business demands**
  - Unpredictable threats, risks, economic conditions, rapid mission changes, changes in major players and organizations, multi-enterprise missions, business processes changing to accommodate new models of business,……
- **Keep pace with changing technologies and products**
  - Not just infrastructure anymore; broad application level products with applicability to government problem space
  - Ever-changing market options based on demands of users



Implications

- **Framework for technology and implementation decisions required:**
  - Enterprise architecture (EA)-based acquisition
  - Ensures technical solution aligns with changing business needs
- **Leverage commercial investments in products and technologies:**
  - COTS-based systems (CBS) solution space
  - Enables rapid alignment with market offerings

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Reconciling Divergent Pressures

- **Enterprise architecture (EA) and COTS-based systems (CBS) tend to drive solutions along divergent paths:**
  - Enterprise Architecture-based acquisition
    - Must consider business needs and processes of the enterprise as drivers for technical solutions
    - Must stay aligned with changing requirements and business models
  - COTS-intensive solution space
    - Must maintain awareness of marketplace
    - Must define a flexible architecture that can exploit latest market offerings
    - Focus is on integration vs. development

Reconciling these divergent pressures requires an evolutionary process that supports simultaneous trades across business needs, market offerings, and architecture tempered by risks: EPIC

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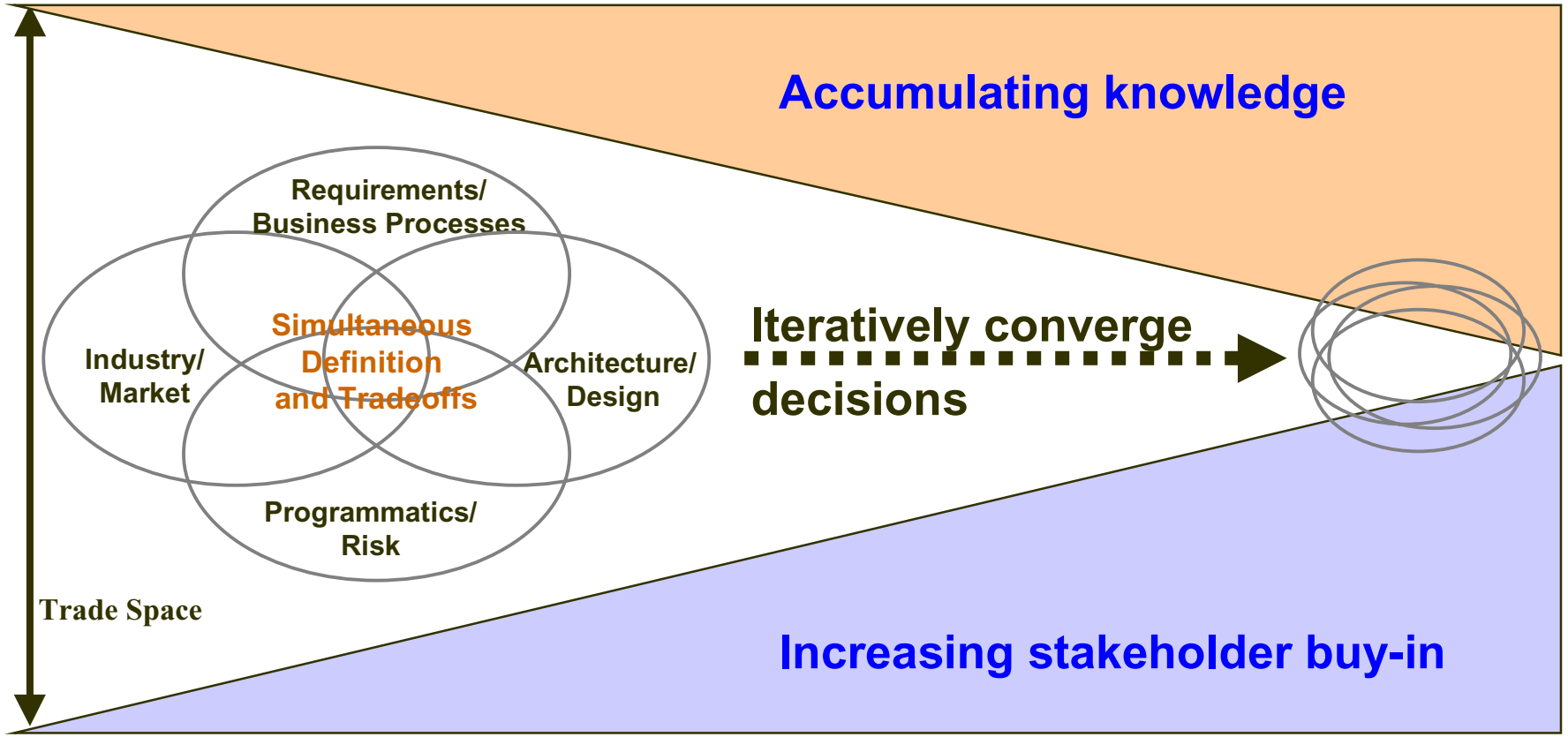
EPIC: An Evolutionary Process for Integrating COTS-based Systems



From 'Evolutionary Process for Integrating COTS-Based Systems (EPIC)' SEI, TR-2002-005, November 2002

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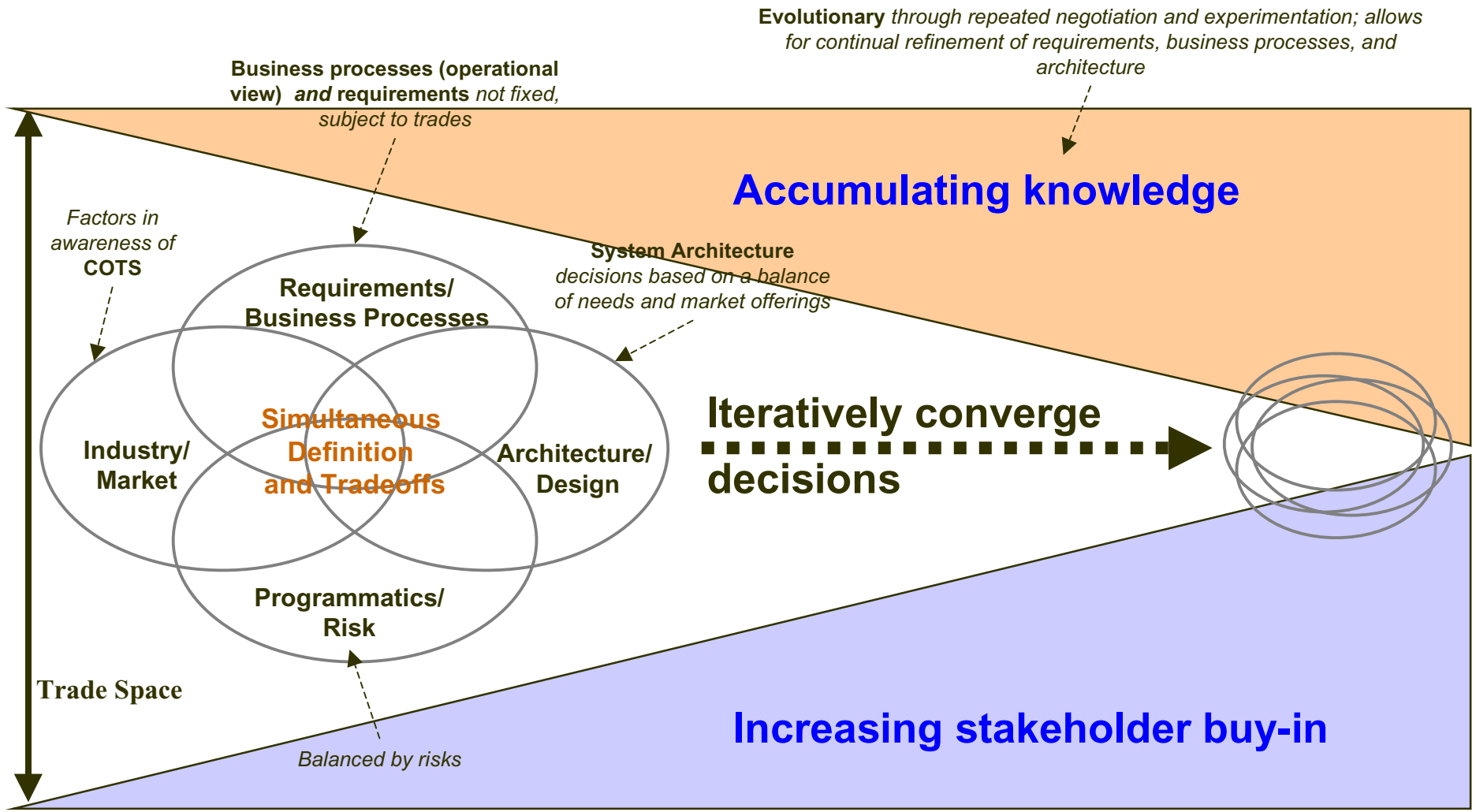
EPIC Aligns With Modern Business Realities



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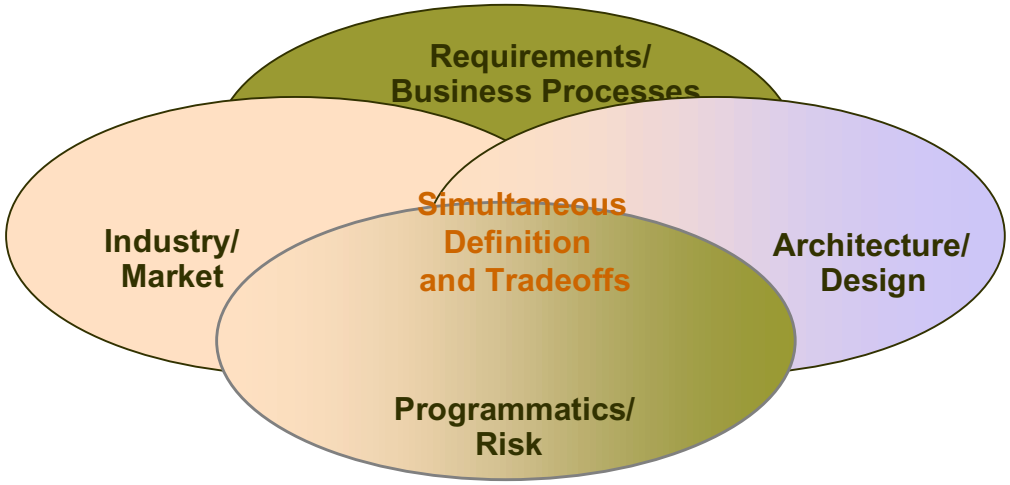
Possible Acquisition Strategies

- There are infinitely many possible programmatic, contractual, etc., strategies to accomplish this: *there is no one right approach*.
- No matter which strategy is employed, there are a number of decisions which much be addressed for a successful outcome.
- The following slides describe possible strategies based on the *allocation of execution responsibilities*, together with a brief discussion of some of the trade-offs which need to be considered in the context of any program.

Execution-based Allocation Strategies Explored

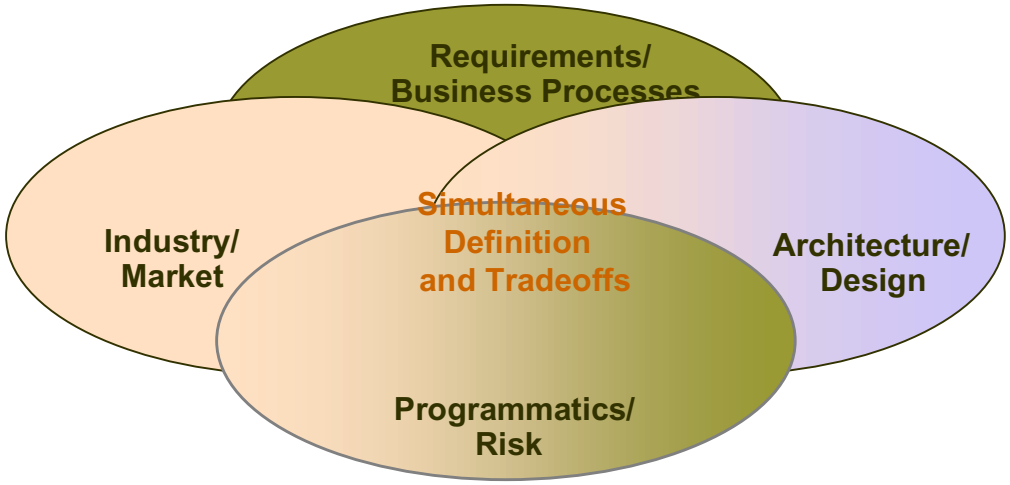
- **Three commonly-used strategies, based on different allocations of execution responsibility, are presented and discussed:**
  - **Strategy #1: "Functional" allocation**, with specific acquisition responsibilities assigned to discrete organizations (both Government and contractor)
  - **Strategy #2: "Project based" allocation**, where responsibilities are assigned according to the scope of the effort (e.g., enterprise, project "*x*," etc.)
  - **Strategy #3: "Site based" allocation**, where responsibilities are assigned on the basis of geographic "spheres of influence"

Strategy #1: Functional Allocation



- **Enterprise Architect**
  - Enterprise-level architectural/business process decisions (i.e., Scope and Enterprise levels of the Zachmann Framework, Levels I and II of the FEAF, or Operational Architecture views in the C4ISRAF)
- **System Developer**
  - System architecture (i.e., below the enterprise-level as defined above)
  - Market/technology forecasting
  - System implementation/spiral management/product selection/modernization decisions
- **Sustainment**
  - Maintenance of fielded systems

Strategy #1: Items for Consideration



- Division of architectural responsibilities across organization/contract boundaries
- Reconciling evolving business processes across organization/contractual boundaries
- Integration/sustainment of continuously-evolving systems
- Incentives to "play nice"

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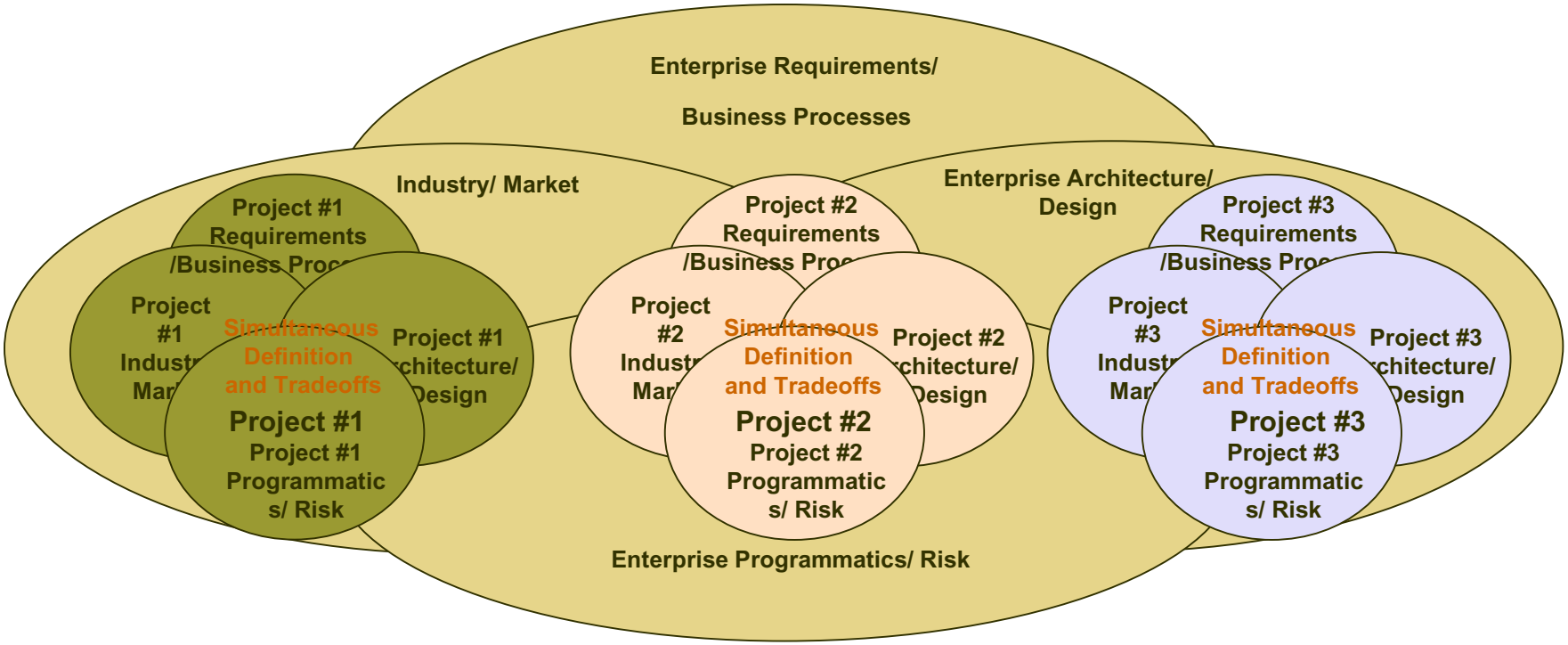
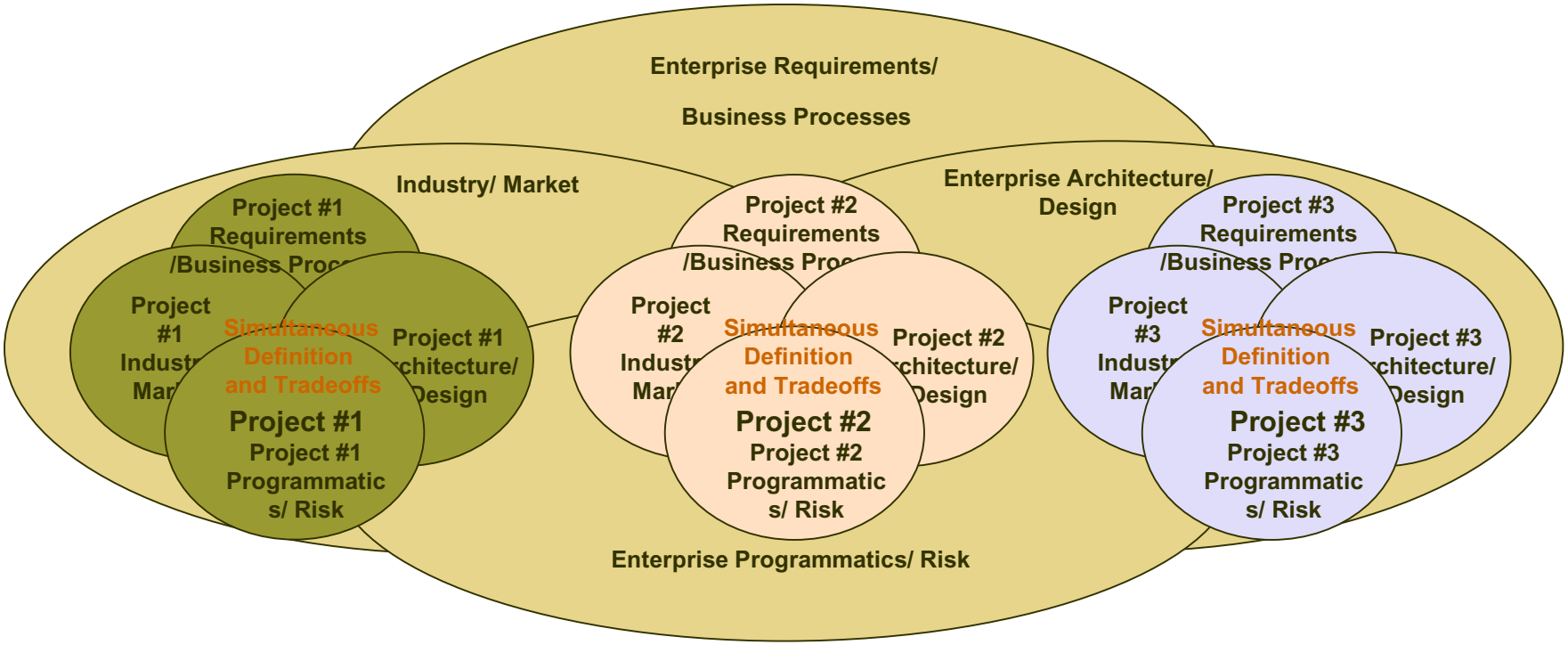
Strategy #2: Project-based Allocation



- **Enterprise architect**
  - Governs overall enterprise architecture and its realignment based on project demands/outcomes
  - Decides on projects to be developed, order of acquisition/development, and their degree of parallelism
- **Project Developers**
  - Each developer (Government entity, or contractor) is allocated requirements and business processes. Contractor has responsibility for project-specific requirements, business processes, architecture, market survey, standards, …with additional requirement to demonstrate that project is EA compliant

Strategy #2: Items for Consideration



- Reconciling project "clashes" (e.g., business processes, architectural compliance, market selections, etc.)
- Maintaining EA compliance with continuously-evolving architecture, systems, requirements, etc.
- Clearly-defined roles and responsibilities
- Incentives to "play nice"

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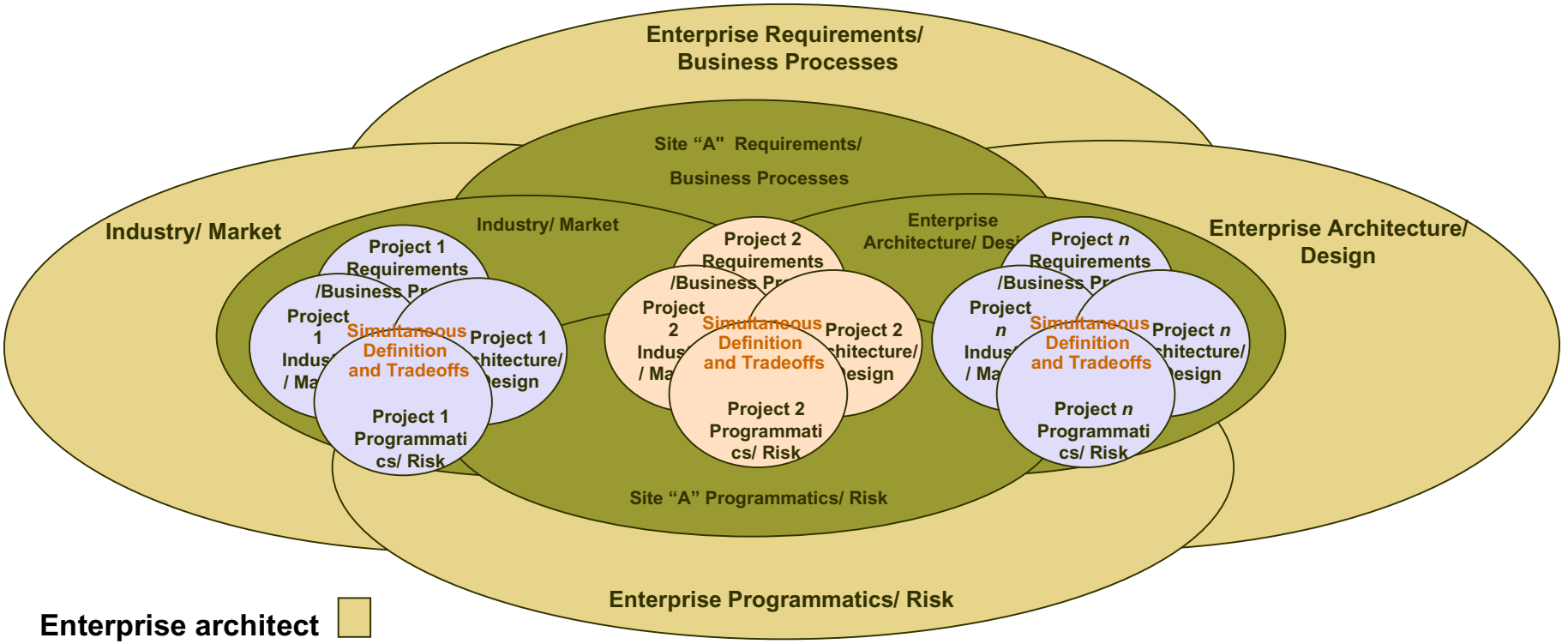
Strategy #3: Site-based Allocation



- **Enterprise architect**
  - Governs overall enterprise architecture and its realignment based on project demands/outcomes
  - Allocates site responsibilities to site integrators
- **Site integrator**
  - Each site integrator is allocated requirements and business processes. Responsibility for site-specific requirements, business processes, architecture, market survey, standards, etc., with oversight of site projects to ensure EA compliance
- **Project developers**
  - Responsible for development and sustainment of systems under site integrator direction

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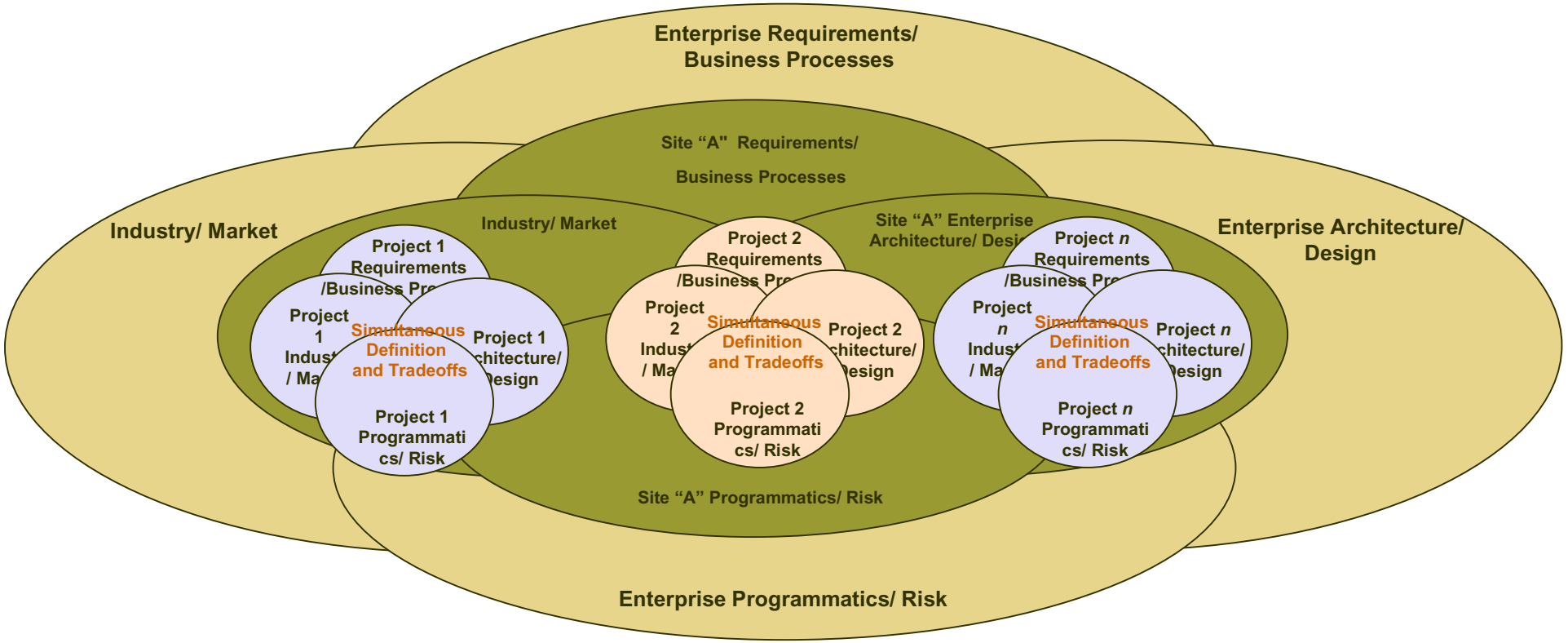
Strategy #3: Items for Consideration



- Maintaining EA compliance across multiple sites
- Synchronizing architectural/business process/requirements changes across multiple sites
- Clearly-defined roles and responsibilities
- Incentives to "play nice"

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Summary

- COTS and EA have the potential to ensure flexible architectures that can adapt to changing business needs and the marketplace, HOWEVER,
- COTS-based systems require iteration and negotiation across multiple spheres of influence, THEREFORE
- Allocation of responsibilities to each of those spheres can help or hinder the advantages of COTS and EA as acquisition strategies