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A CASE STUDY IN WORKFORCE SOA EDUCATION

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Case Study Environment

- **Heterogeneous Workforce**
  - Various career lengths
    - Hundreds of new personnel within 5 years
    - Large portion of workforce within 10 years of retirement
  - Multiple job functions
    - Program Manager
    - Project Engineers
    - Support Engineers
    - Logistics
    - …
- **Core Competencies**
  - Networks
  - C4I
  - Information Assurance
  - …
- **New work area**
  - SOA
    - XML
    - Web Services
    - REST
    - ESB
    - Orchestration
    - …

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How do we educate our workforce in SOA?

- **Initial Questions**
  - How do we identify appropriate learning resources?
  - How do we prioritize access to limited resources?
  - What different levels of learning resources should exist for different job functions?
- **Problem Statement**
  - As organizations have adopted the concepts of SOA and associated technology, the primary focus has been to address the technical and (to a lesser extent) governance challenges. Without addressing the standard level of knowledge available, an organization cannot efficiently surmount the obstacles associated with SOA transformation.

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Factors of the problem

- **Personnel**
  - Individuals attempt to learn what technology is associated with service orientation without understanding why the organization is moving towards the concept.
- **Organizational**
  - Fragmentation and fragile nature of the relationships between government, commercial and academic communities does not facilitate an educational environment.
    - Point to point relationships
    - Inter/Intra-organizational rivalries
    - Paradigm shift: need to know → need to share

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Processes to address the problem

- **Learning Resource Identification (LRI)**
  - Learning resource source identification
  - Source relationship formation
- **Training Process Augmentation (TPA)**
  - Process improvement activity
  - Courseware/curriculum deployment preparation
  - Integration of measures of effectiveness
- **Curriculum Development Process (CDP)**
  - Grouping of learning resources into organization related tracks

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Education components

SOA Education

Processes	Your organization	External knowledge sources
• LRI • TPA • CDP	• SME • Dedicated HR staff	

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Learning Resource Identification

- **Questions that this process should answer**
  - How does the organization receive knowledge?
  - How is organizational knowledge shared with the sources?
  - How does that sharing benefit the organization and the sources?

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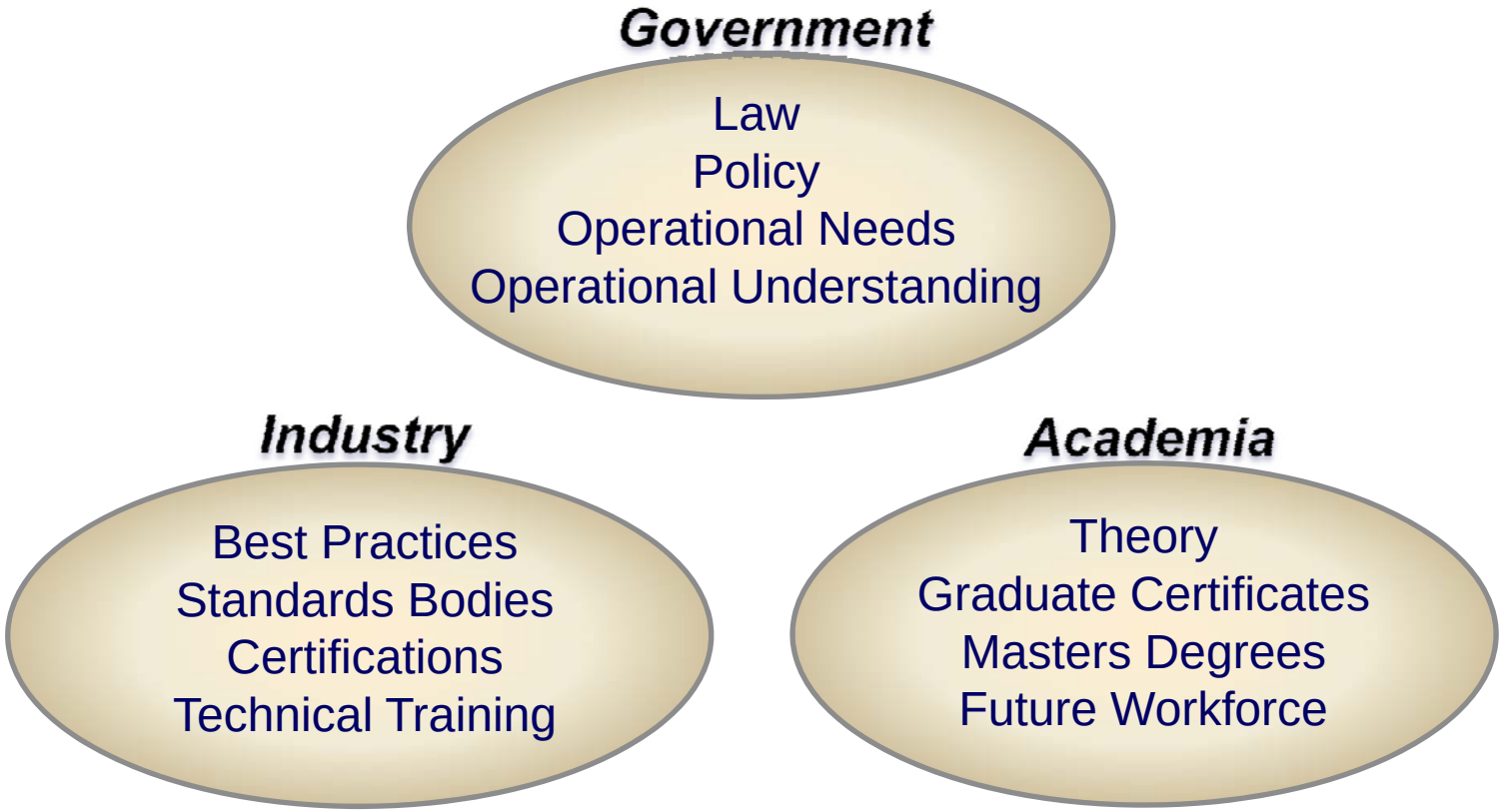
LRI Source Identification

- **Identify organization's knowledge sources**
- **Identify knowledge gain from each sources**



Source identification for our organization

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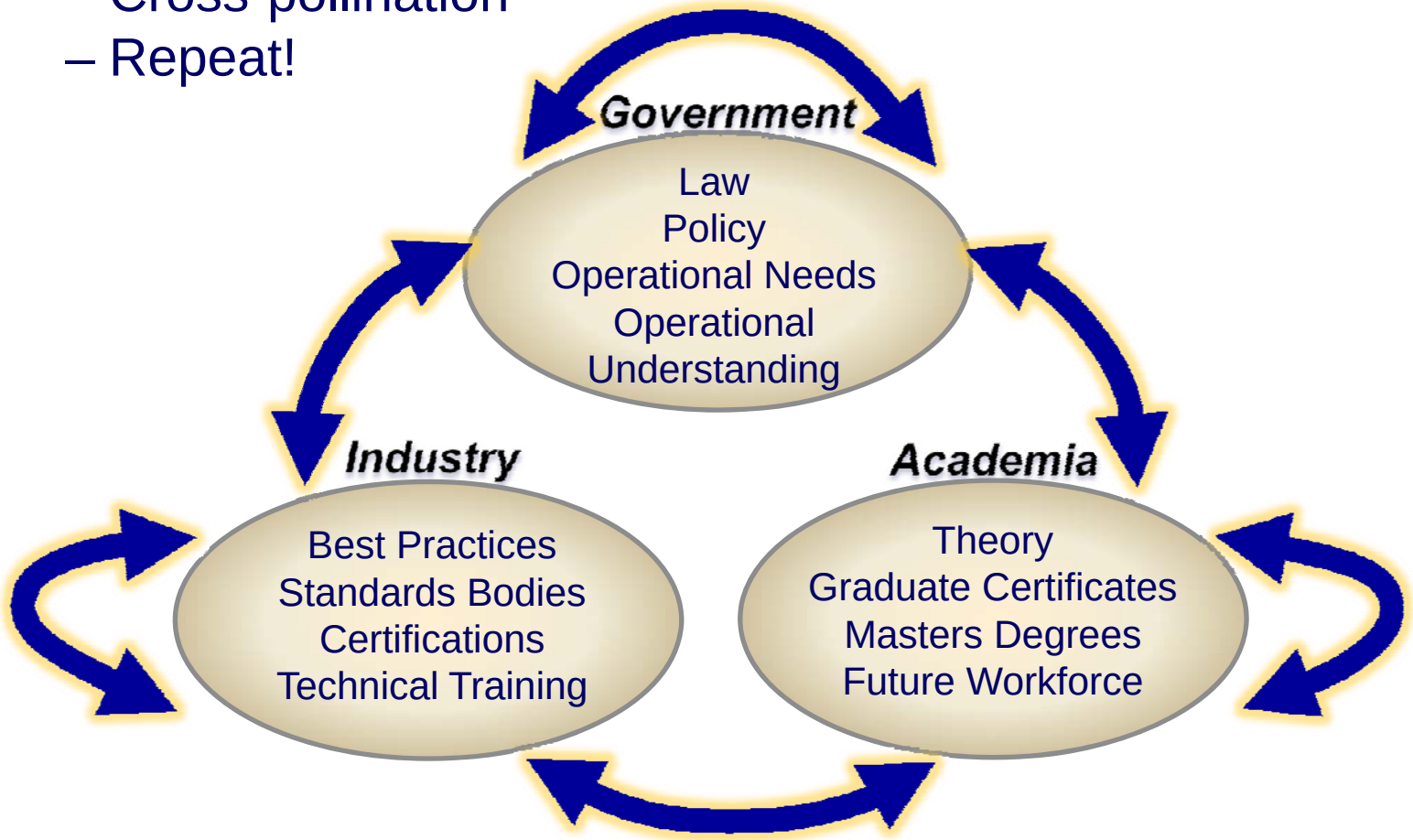
LRI Relationship Formation

- **Relationship Formation**
  - Coordinated with organization's subject matter experts
  - Dedicated HR personnel
  - Cross-pollination
  - Repeat!



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LRI Results

- **Comprehensive set of learning resources**
  - Policy documents
  - Online resources
  - Industry certifications
  - Graduate certificates/Masters degrees
- **Dual competency educational opportunities**
  - Relationships facilitate learning credit recognition between and within organizations
  - Credit recognition produces multi-purpose educational products
- **Begins to address personnel and organizational challenges**

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Training Process Augmentation

- **Mindset change**
  - Training → Education
  - Training
    - Focuses on learning a known skill
    - Is for immediate tactical needs
  - Education
    - Focuses on a way to think
    - Is for long term strategic needs
    - Better approach to SOA
  - Organizational processes for learning change as mindset changes

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TPA example: Training request

- **Old process**
  - Yearly individual development plan (IDP)
  - Work unit training budget approval
  - Worker training request
  - Supervisor authorization
- **Modified process**
  - Analyze IDP data for workforce interest in SOA
  - Notify workforce of specific offerings
  - Management concurrence on individual preparation/attendance
- **Result**
  - Unit level scope → Command level scope

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TPA Example: Certification tracking

- **Old process**
  - Attend and complete course
  - Submit completion form
  - Supervisory concurrence on completion
  - Training personnel store certification
- **Modified process**
  - Increased scale/scope of tracking
    - Examples
      - Modularized industry certifications
      - Graduate coursework
- **Result**
  - Better metrics
  - Increased workload

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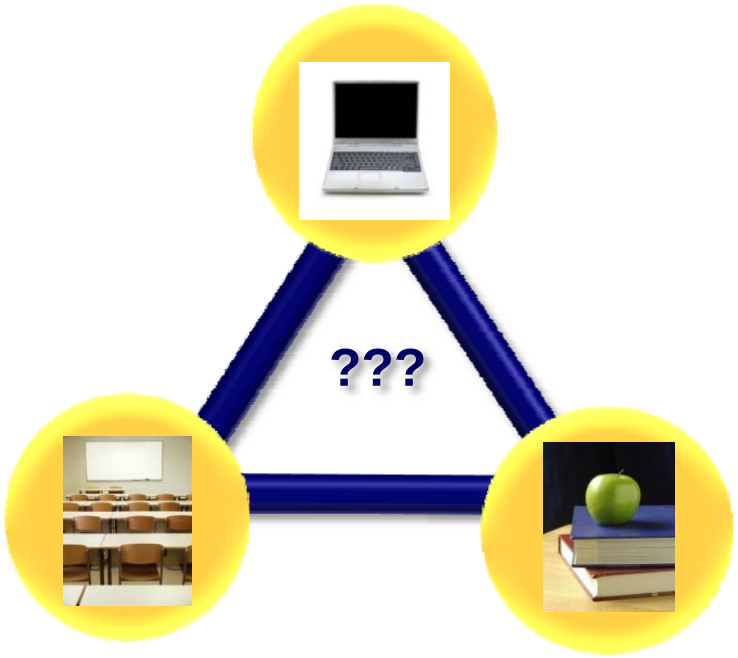
TPA example: Training analysis

- **Old process**
  - Comments on course completion
- **Modified process**
  - Likert scale survey and comment sheet
    - On completion
    - On cancellation
  - Individual interviews
    - Determine integration into work
    - Requests and recommendations
- **Result**
  - Objective measures of success
  - More workforce input into their education

Curriculum Development Process

- **Organization considerations**
  - Leveraged corporate resources
  - Presentation
  - Time requirements
  - Course Types
  - Curriculum entry and exit points



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CDP Job Functions

- **Determine a set of cross competency job functions**
- **Develop learning objectives for each job function**

Job Functions Examples

JOB NAME	JOB FUNCTION	OBJECTIVES
Project Engineer & Architect	Manage the engineering effort and develop the system requirements based on the operational capabilities. Sets engineering standards, processes and policies.	SOA drivers, SOA concepts, technologies, standards, best practices, governance, security
Developer & Support Engineer	Develop the components of the system specified by the project engineer	SOA drivers, SOA concepts, technologies, best practices, security
Testing & Assessment	Create metrics for development and operational testing of a system	SOA drivers, SOA concepts and testing/analysis methodologies
Program Management	Monitoring the key management tradeoffs (cost, performance, schedule) and management of acquisition requirements.	SOA drivers, SOA concepts and governance
Resource Sponsor	Specify operational capabilities that need met	SOA drivers, SOA concepts, governance

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CDP Courseware

- **Develop a list of courses and online resources from LRI**
- **Organize offerings by delivery method**
- **Leave placeholders for offerings needed to meet job function learning objectives**

Courseware Example

COURSE	PROVIDER	TYPE
SOA drivers/basic concepts	Internal	Online
Standard A	Vendor A	Online
Standard B	Vendor A	Online
Standard C	Vendor A	Online
SOA best practices, pitfalls…	External gov't	Online
SOA industry certification A	Vendor B	Classroom
SOA industry certification B	Vendor B	Classroom
SOA industry certification C	Vendor B	Classroom
SOA industry certification D	Vendor B	Classroom
SOA industry certification E	Vendor C	Distance Learning
SOA industry certification F	Vendor C	Distance Learning
Graduate Certificate	Various	Distance Learning
Masters Degree	Various	Distance Learning
SOA Testing Tools	TBD	TBD

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CDP Track Specification

- Assign specific courses to job function tracks
- Set mastery levels within each job function track
- Peer review by organization subject matter experts
- Yearly refresh of courseware and tracks

Project Engineering Track

COURSE NAME	REQUIREMENT	LEVEL
SOA drivers/basic concepts	Mandatory	1
Standard A	Mandatory	1
Standard B	Optional	1
Standard C	Optional	1
SOA best practices, pitfalls to avoid	Mandatory	1
SOA industry certification A	Mandatory	1
SOA industry certification B	Mandatory	2
SOA industry certification D	Mandatory	3
Graduate Certificate	Optional	3
Masters Degree	Optional	3

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CDP Results

- **Benefits (if done right)**
  - Institutional drivers for SOA are identified and summarized
  - Overall understanding in organization is increased across workforce
  - Courseware
    - Various lengths
    - Various audiences
    - Different learning styles
    - Different professional development tracks
  - Organizational tracking of skill levels
  - Skills gap recognition through SME analysis and curriculum refresh

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Lessons Learned

- **Various analysis opportunities are crucial**
  - User identified skill gaps
  - Help identify negative reinforcement in processes
  - Develop communities of interest within organization
- **Technical and managerial assessments are equally important**
  - SMEs provide operational view
  - HR personnel provide tracking and process stability
- **Relationships provide new opportunities**
  - Enhanced organizational knowledge of industry specialties
  - Early notice of technology trends
  - Better educational products

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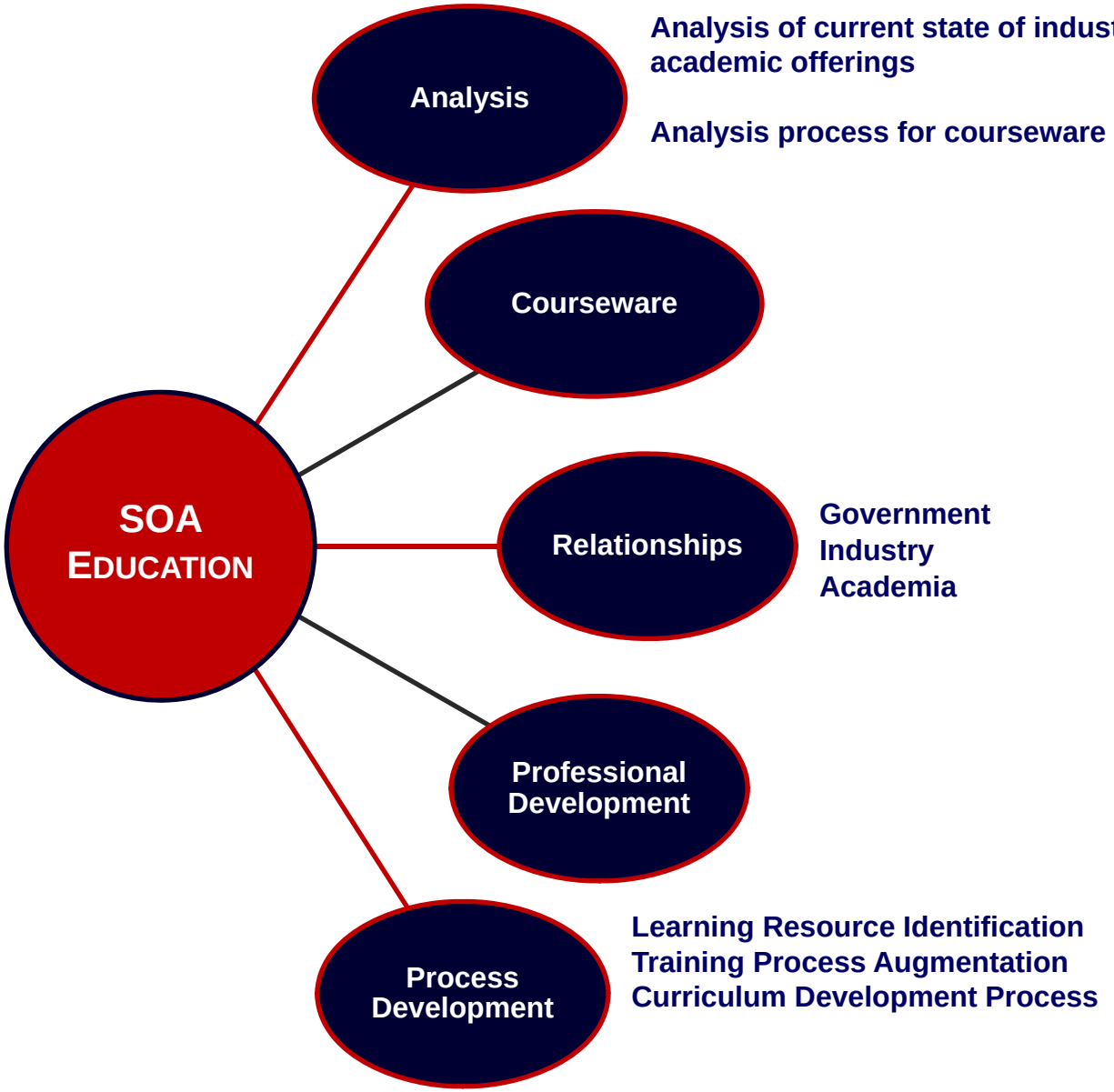
Summary



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Questions?