



Estimating SOA, As Easy as 1 2 3



Arlene Minkiewicz

Chief Scientist

17000 Commerce Parkway

Mt. Laure, NJ 08054

arlene.minkiewicz@pricesystems.com

856-608-7222

Agenda

- **Introduction**
- **What is Service Oriented Architecture (SOA)?**
- **SOA Cost Considerations**
 - SOA Governance
 - Service Development
 - Middleware Integrations
- **Conclusions and Future Work**

Introduction

- **This paper is based on findings of a research project for the Army focused on the cost implications of creating and deploying Service Oriented capabilities**
- **This phase of the research focused specifically on identifying and addressing gaps between traditional cost estimating methodologies and the following SOA activities:**
 - SOA Governance
 - Service Development
 - Dealing with middleware
- **This paper proposes a methodology for SOA Governance and makes additional recommendations for adapting traditional estimating methods**

Introduction to SOA

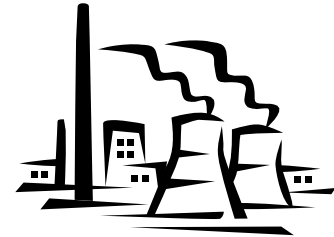
- **SOA uses networking capabilities to integrate applications in a way that is independent of:**
 - Architecture
 - Programming language
 - Development platform
 - Vendor

- **Service Orientation can be thought of as the next generation of object orientation**
 - New degree of abstraction
 - More sophisticated tools available to deploy

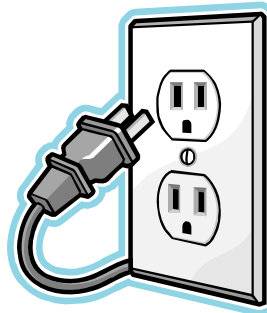
Service Orientation – Not a New Concept



Service Consumer



Service Provider

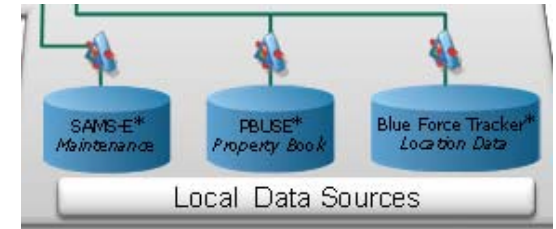
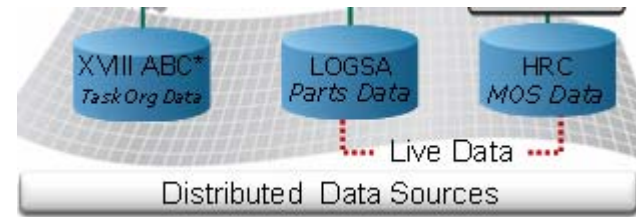


Interface

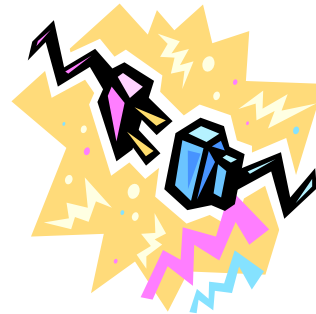
SOA from a Software Perspective



Service Consumer



Interface



Service Providers

Building Blocks of a SOA

■ Service

- Software implemented capability that is well-defined, self contained and does not depend on context or state of other services

■ Service Consumer

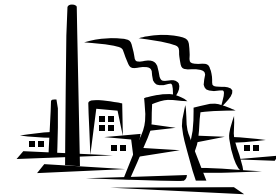
- Service, application or other software component that requires a specific service.
- Located through registry
- Initiates service through mandated interface



Building Blocks of a SOA

■ Service Provider

- Software entity that represents the service being delivered
- Provider makes service contract available through service registry
- Provider accepts and executes request for service



■ Service Registry

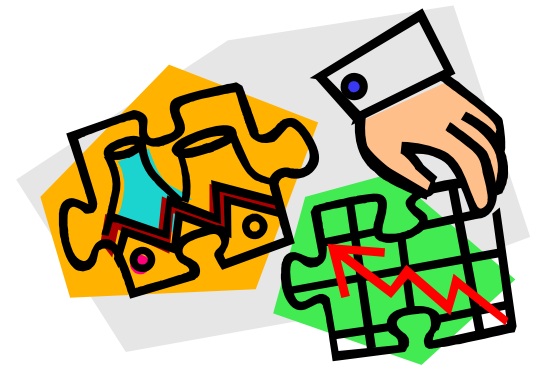
- Network space where service providers publish contracts and consumers locate services

■ Service Contract

- Vehicle through which provider and consumer seal the deal

SOA Cost Challenges

- **SOA Governance**
- **Service Development**
- **Middleware Integration**



Governance

- **Wikipedia defines IT governance as**
 - ‘the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategies and objectives”

- **SOA Governance is a subset of IT governance focused on control over adoption and implementation of SOA including.....**
 - Strategic adoption approach
 - Define SOA.....
 - Standards
 - Policies
 - Contracts
 - Service Level Agreements

SOA Governance

- **SOA becomes valuable when service design, implementation, and usage is governed in such a way that leads to:**
 - Reduced Integration Expense
 - Increased Asset Reuse
 - Increased Business/Mission Thread Agility

- **SOA Governance is a concept used for activities related to exercising control over services in a SOA so that the proposed value is realized.**

SOA Governance

- **“SOA Governance” is a set of activities related to exercising control over services in an SOA.**
 - Some governance activities are **high-level**, and generally have enterprise-wide application or are ongoing oversight activities.
 - Some governance activities are low-level, and apply only to specific services or sub-projects of a more broad SOA initiative.

SOA Governance high-level activities

■ SOA Policy and Strategy Development

- Detailing a vision of the end-state
- Creating/enforcing broad SOA policies
- Strategizing SOA adoption
- Selecting candidate SOA projects
- Creating an incentives system
- Addressing funding issues.



■ SOA Education, Promotion and Marketing

- Promotion and marketing of enterprise SOA capability
- SOA Policy education
- Procedural training

SOA Governance high level activities

- **Service Provisioning Governance**

- Ensure sharing
- Align software governance with business governance,
- Manage reuse across internal and external domains

- **Service Performance Monitoring and Optimization**

- Oversee the instantiation and on-going use of automated service performance monitoring software
- Develop and use governance metrics
- Analyze metrics
- Address failures
- Identify areas for optimization



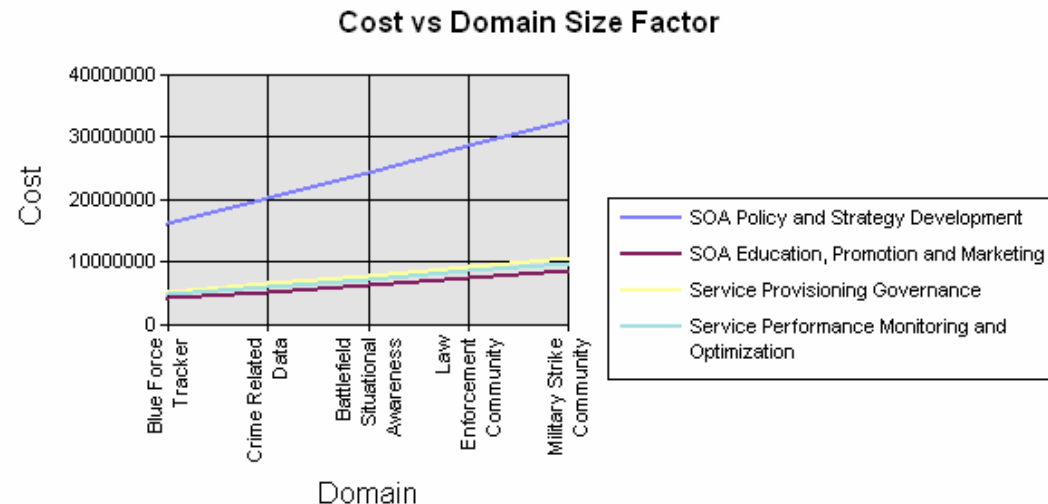
SOA Governance Cost Drivers

- **Domain Size Factor**
 - measure of the scope and intricacy of data, processes, and relationships common to the domain of an SOA initiative.
- **Project Scope Factor**
 - measure of the scope of requirements for the individual projects of the larger SOA initiative being modeled.
- **SOA Maturity**
 - Organizational SOA Maturity
- **Security**
- **Operating Specification**

Domain Size Factor

Baseline Domains

- 80 - Military Strike Community
- 70 - Law Enforcement Community
- 60 - Battlefield Situational Awareness (subset of Military Strike Community)
- 50 - Crime-related Data (subset of Law Enforcement Community)
- 40 - Blue Force Tracking (subset of Battlefield Situational Awareness)
- 35 - Supply Chain Management
- 30 - Basic Commercial Banking
- 20 - Human Resources

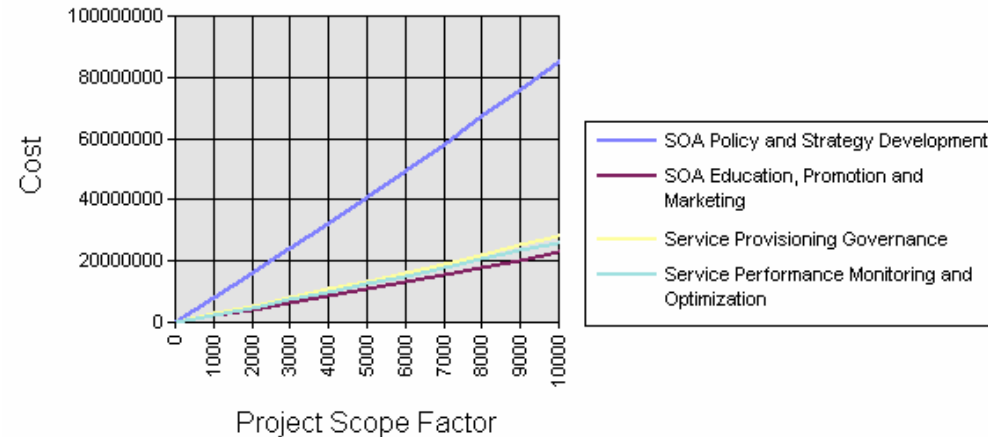


Project Scope Factor

■ Measure of

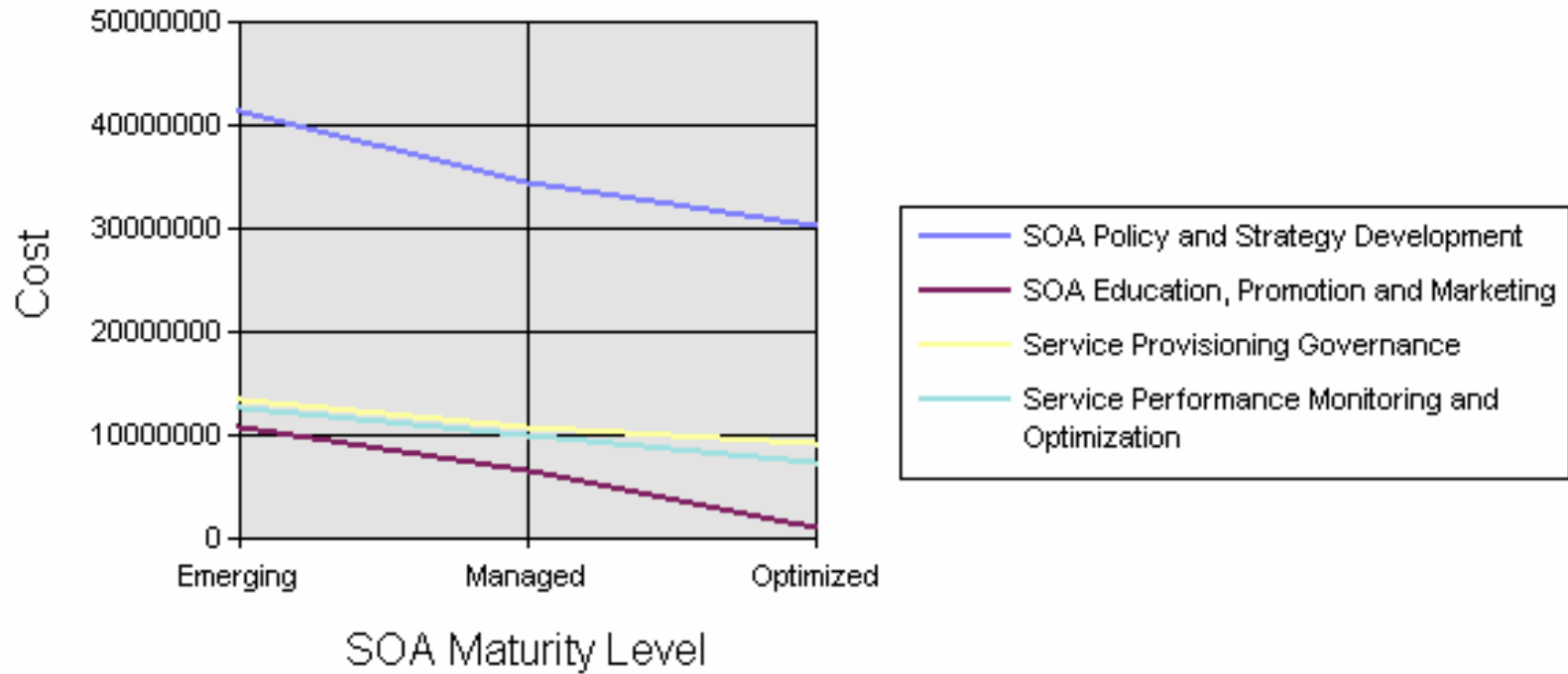
- Number of entities that contribute to SOA information sharing requirements where an entity is defined as either
 - Organization
 - Platform
 - System
- Where entities are classified to describe how much of the domain attributes for common data and processes overlap with their own attributes

Cost vs Project Scope Factor



SOA Maturity Level

Cost vs SOA Maturity Level



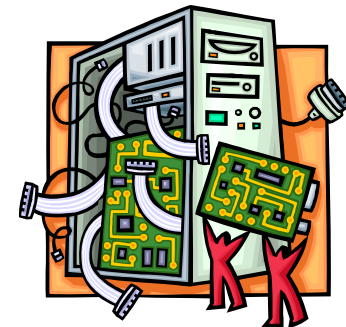
Service Development

- **Not very different from other software development**
- **Traditional software estimating methods should take into account that.....**
 - Properly governed SOA requires that services be developed for significant reuse
 - In order to enable reuse, quality and documentation requirements may be significant
 - In order to ensure that service behaves well in unintended applications, testing requirements may be significant
 - Organizations new to SOA need to incorporate this fact into productivity and personnel factors

Middleware Integration

- **Middleware applications provide necessary technology components to realize interoperability and to promote capability sharing**

- **Examples include**
 - Enterprise Service Bus - abstract layer for msg
 - Enterprise Service Management – monitory, metrics, reports
 - Business Process Management – enforce business process
 - Security Middleware – security and identity enforcement
 - Registry/Repository – discovery and evaluation



Middleware Integration

- **Traditional software estimating methods should take into account that.....**
 - Middleware is Commercial off the shelf software (COTS)
 - Sizing should be based on a functional metric based on capability actually being used
 - Significant tailoring is required during initial stages of SOA initiative
 - Additional, low level, tailoring can be expected as additional services are deployed
 - Once infrastructure is in place and stable, integration complexities should be very low

Conclusions and Future Work

- **Some aspects of SOA initiatives are not easy to estimate using traditional methodologies**
 - Middleware Integration and Service development require new perspective
- **SOA Governance is a particular area of concern**
 - Traditional project size metrics irrelevant
 - Domain size and project(s) scope relative to a SOA initiative appear to be better measures
- **This research is in progress and on-going**
 - We've postulated a set of CERs for SOA governance based on theory and experiential data.
 - Next step is to validate and refine using actual project data