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An Update to the SOA Adoption Roadmap Framework

We continue to develop our thinking on SOA Adoption Roadmap as we work with customers. In this report I am mapping out the framework in a more orderly manner than I have done previously, and also taking the opportunity to introduce practical guidance on customization for various circumstances that I have encountered. I have also updated and structured our guidance on patterns.

By David Sprott

Independent Guidance *for* Service Architecture and Engineering

SOA Adoption: An Update to the SOA Adoption Roadmap Framework

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Introduction

This guidance note provides further structure in support of the SOA Adoption Roadmap Planning Work Packages and Tasks. It commences with a discussion of the Phases and Streams, and addresses customizing the approach for different circumstances plus adoption strategy.

Roadmap Structure

Introduction to Roadmap Phases

SOA adoption is a complex change management task requiring alterations in practices impacting a wide range of disciplines spanning IT and business. The ability of large enterprises to make profound change is limited by the complexity of existing application and technology portfolios and the need to continuously provide adequate support to changing business process and information requirements. For the typical enterprise therefore, achieving maturity in SOA will not happen without thorough planning that addresses the twin objectives of uninterrupted business support and SOA maturity, and ensures a sensible balance between them. In consequence transforming an enterprise to SOA will be a multi-year program.

A key technique in managing the SOA transformation is to phase the activity. In each phase clear targets for process improvement and asset development are set that enable progressive practice improvement.

Phases enable us to:

- Control or manage risk

- Manage investment – "just-in-time" development of advanced capabilities

- Control expectations – typically some classes of business benefit might only be possible in the later phases

- Align capability dependencies[1]

- Coordinate and manage work of disparate groups – which will typically be loosely coupled, with cross-group dependencies defined at phase boundaries

Basic Phase Model

The basic Phase model has been developed to guide a typical large enterprise in constructing an SOA Roadmap and is in use by many corporations and government departments.

The focus of the Roadmap Phases is to coordinate the broad set of capabilities needed to

deliver and use services that meet particular outcomes. Given the extent of change needed to fully adopt SOA it is strongly advisable to deliberately stage and constrain the nature of the outcomes such that an organization or enterprise evolves in a controlled manner to full competency and capability with managed risk. See below discussion on strategy.

The basic Phase model maps to a pattern which can be observed in many enterprises. In the early stages of SOA the primary requirement is to establish technical competence and capability. Major change in project organization is inappropriate and unjustifiable, until basic competencies are established and proven. Accordingly key capabilities need to be put in place to ensure early efforts are successful within some defined restrictions. Once confidence and trust has been established a more strategic approach is feasible, with much greater business involvement.

Phase	Primary Outcomes	Key Strategies
Early Learning	Base skills in core group Proof of concept Prototype services and automation units only. Reference implementation	Experimentation Initial CoE Benchmarking and learning from many sources Proof of concept projects Vendor evaluations, demonstrations and trials
Applied	Better structured projects Technical SOA competency for narrow domain.	Project focused SOA Project ESB Lead projects learn and share experience Minimum enterprise level reference architecture
Integration	Reduced integration effort Reuse of key services No further growth in point to point integration SOA technical competency expands to support broader usage patterns	Centralization of architectural control and governance over all integration activity Services by opportunity Data model led service architecture Largely IT led activity Evolve reference architecture on basis of experience
Enterprise	Shared services Consistent business information and processes	Business involvement Joint business and IT programs Business model led service architecture Wrap existing systems and expose portfolio of Core Business Services for enterprise use
Ecosystem	Shared business processes Consistent shared information	(Vertical) Industry standard services Shared infrastructure protocols, gateways, management environment Collaboration architecture

Table 1 – Basic Phase Model
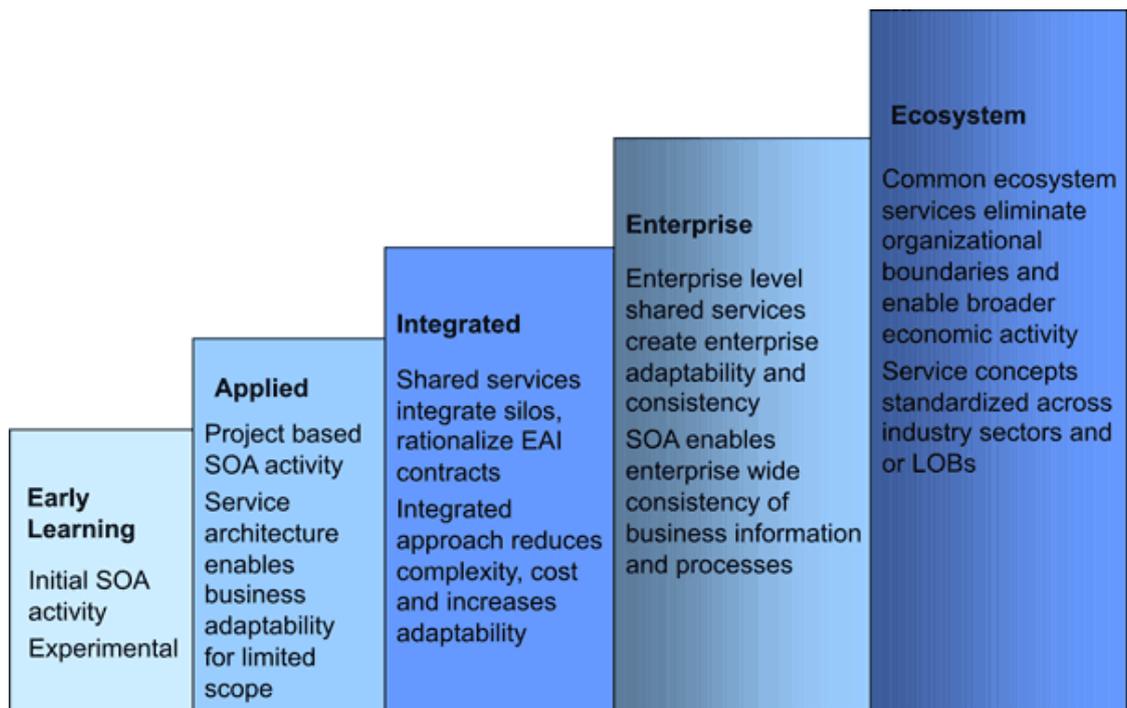
Figure 1 – SOA Adoption Phases – Basic Pattern

Customizing Roadmap Phases

The basic Phase Model is widely applicable. However there will be situations where the Phase structure needs to be modified. We can recognize these as common patterns.

Pattern	Requirements	Candidate Phase Structure
Enterprise Adoption (Basic pattern)	Establish technical capabilities and competence, prove justification, progressively engage business in planning and governance	• Early Learning • Applied • Integration • Enterprise • Ecosystem
Government Adoption	Establish appropriate level of standardization and sharing of technical capabilities across public agencies. Note individual agency or department would use a standard enterprise approach.	• Community of Interest • Common standards • Joined up government
M&A	Integrate SOA into M&A plan to both facilitate business integration and establish effective new business model based on service principles	• Due Diligence • First 100 Days • Integration
Major Program	SOA capabilities required specifically for major program.	• Reference Framework • Narrow Path • Program

Table 2 – Alternative Phase Structures

In each of these patterns there is further opportunity for customization, particularly of the core rollout phases – Enterprise, Ecosystem, Integration and Program. In these phases there may well be specific product, organizational, program related phasing that will be highly dependent upon specific capability sets, for example federated security, commodity grid infrastructure, service application platform completion etc.

Note that some of these patterns do not involve a progressive expansion of scope, and are not based on an expectation that the SOA activity will be pushed into the ecosystem.

Introduction to Roadmap Streams

SOA transformation impacts across many disciplines within IT and business. In a typical enterprise there will be many organizational units involved in practice and technology improvements and the need for cross organizational coordination of change. We use the concept of Stream to provide topic focus - a stakeholder relevant perspective that is independent of the current organization structure. This allows change management activity to be more easily managed and coordinated, providing a tight focus on particular subjects. We use Streams to:

- Organize the change management program

- Introduce separation of concerns

- Facilitate cross organization collaboration on capability development and delivery

- Define the required capabilities to support each SOA transformation phase

- Create organization neutral work packages

Basic Stream Model

The basic Stream model, like the Phase model has been developed to guide a typical large enterprise in constructing an SOA Roadmap and is in use by many corporations and government departments.

Roadmap Streams should be organized to harness and coordinate the work of stakeholders in common disciplines (infrastructure, architecture etc) to create a cross organization approach for the activities needed to plan, develop and deliver the SOA capabilities required in defined phases.

Each stream has a different way of managing capabilities, and may have different time horizons. Installing tools and organizing training courses may be fairly short-term; delivering architectures and projects may be medium-term; and delivering business benefits may be longer-term.

Stream	Capability Scope
SOA Management	Management tools including vision, strategy, funding, charging, measurement and monitoring and SOA adoption plans and management.
Business Design	The business models and business transformation plans that shape a service oriented business and integrate and drive requirements for service architecture

Stream	Capability Scope
Architecture	The service architecture and Service Portfolio Plan (SPP)
Operational Infrastructure	Operational infrastructure architecture and implementation to support the run time service life cycle states. Includes run time registry, ESB, monitoring, mediation, security, orchestration, policy and management,
Life Cycle Infrastructure	Life cycle support architecture and implementation to support planning to delivery service states. Includes registry, repository and asset management, modeling tools, development and assembly tools.
Framework & Process	The reference framework including concept model, reference architecture and process to enable and coordinate federated service delivery and execution.
Organization	Defined roles and responsibilities required to create, operate, manage and govern a service environment.
Projects & Programs	Capability to execute classes of project and or program, defined as project patterns.

Table 3 – Basic Stream Model
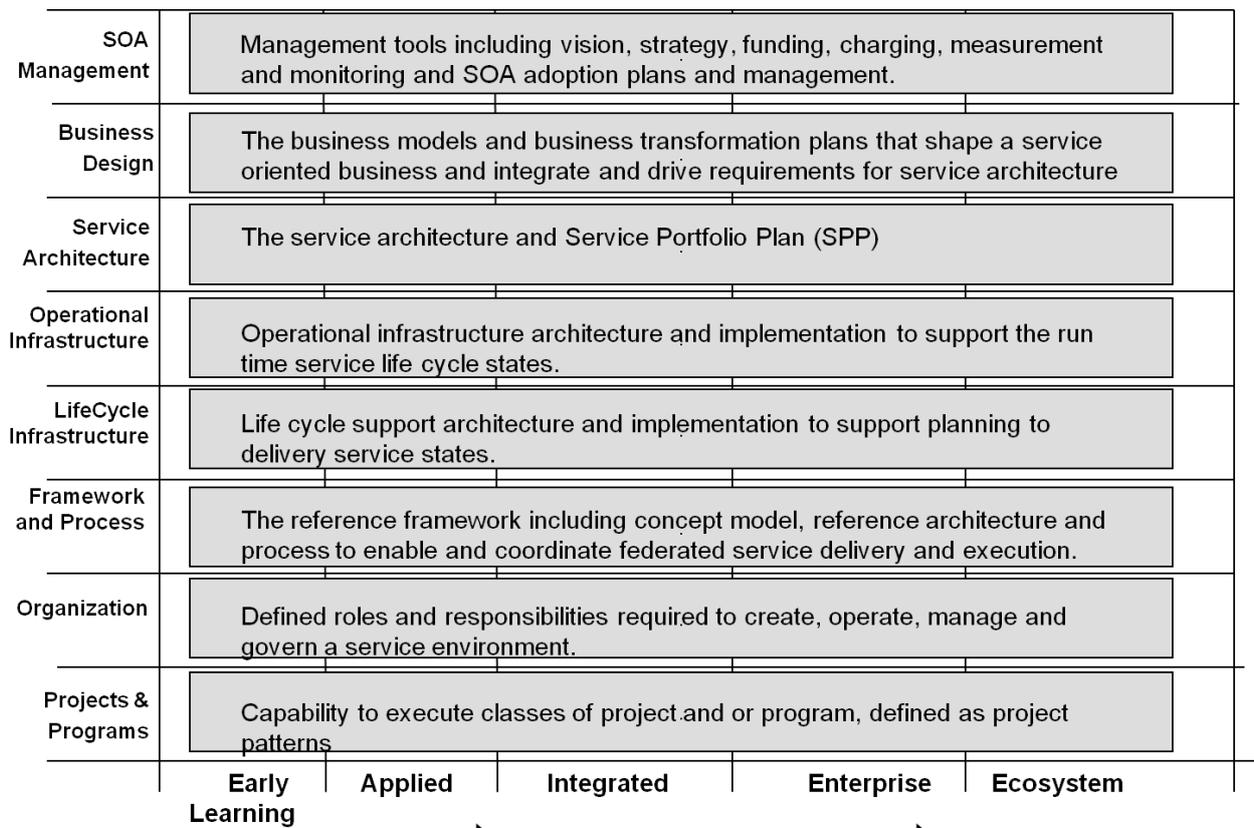
Figure 2 – SOA Adoption Streams

Customizing Roadmap Streams

The basic Stream Model is widely applicable. However there will be situations where the Stream structure needs to be modified – perhaps to place more emphasis on particular capabilities.

Pattern	Requirements	Candidate Phase Structure
Enterprise Adoption (basic pattern)	Facilitate cross organization collaboration on capability development and delivery	Management Business Design Service Architecture Operational Infrastructure Life Cycle Infrastructure Framework & Process Organization Projects & Programs
Offshoring or Outsourcing or Procurement	Manage 3rd ;party relationships	Streams should reflect major divisions and boundaries of major areas of responsibility. Contracts between the parties will be defined in the Framework and Process Stream.
M&A	Streams will need to be aligned with M&A integration plan. The two companies' adoption plans will need to be initially managed separately and then potentially converged to some extent.	Management and Organization are likely to become part of the M&A integration management plan. Parallel streams will be necessary for some period of time. Each stream-pair may converge at a different point
Federated Organization	Major units of an enterprise share selected elements of the SOA Roadmap. For example government departments, highly independent lines of business within the same business entity.	Shared Streams with significant level of overlap are likely to be: Framework and Process Operational and Life Cycle Infrastructure Possible fragments of Service Architecture

Table 4 – Alternative Stream Structures

Scope

The default scope of an SOA Adoption Roadmap plan will be the enterprise. But there may often be other considerations and priorities that influence the scope decision. The most common is the need to deliver a project or program; or a cluster of projects.

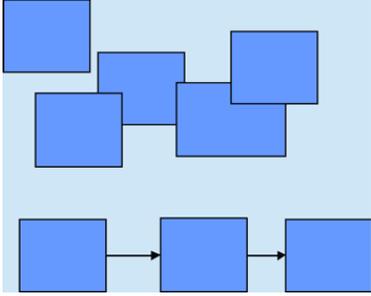| Scope	Requirements	Candidate Scoping Strategies
Program or Project	Assess project and or program objectives against current organizational capabilities and establish risk. Identify key capabilities that need to be in place to ensure attainment of project or program objectives.	Develop narrow path adoption plan – relevant to Early Learning and possibly Applied Phases Collaborate with peer projects
Leading edge business unit	A major division may have the requirement to accelerate the SOA transformation on a different, faster timescale than other business divisions.	Opportunity for other business units to reuse; avoid reinventing the wheel Need to create Collaboration Plan, that defines a) areas of standardization and commonality b) requirement for coordination
Independent business division (commercial) Single agency or sector (public sector)	A major business division may be operated in a highly independent manner and have little functional overlap with other business divisions. Independence is a defined business strategy chosen to optimize time to market and or inter divisional competition.	Manage relationships as for ecosystem Share on a collaborative basis where is makes sense: a) to facilitate process and information interoperation b) to share / optimize costs
Ecosystem (commercial) Whole government	A supply chain, partnership, information network or similar need to establish some level of standardization in order to facilitate wide area business processes and information sharing	Share on a collaborative basis where is makes sense: c) to facilitate process and information interoperation d) to share / optimize costs

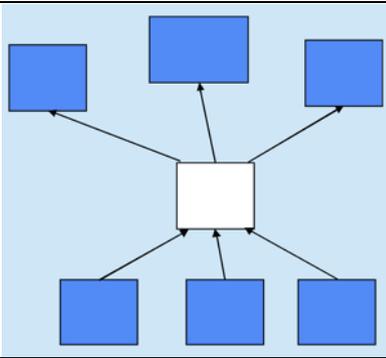**Table 5 – Adoption Scoping Strategies**

Roadmap Strategy

Experience gained from assisting many enterprises to plan their SOA adoption has shown there are a number of common adoption strategy patterns. The patterns are quite distinct, with clear triggers and characteristics, however there will clearly be some considerable overlap in activities.
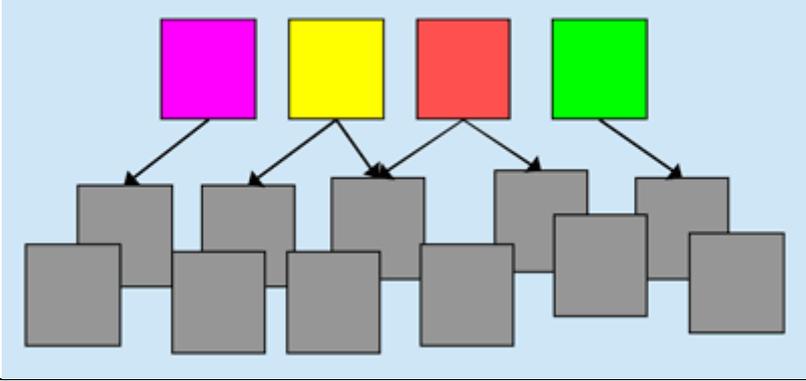
The patterns have relevance for particular phases, and therefore will be superseded by other patterns.
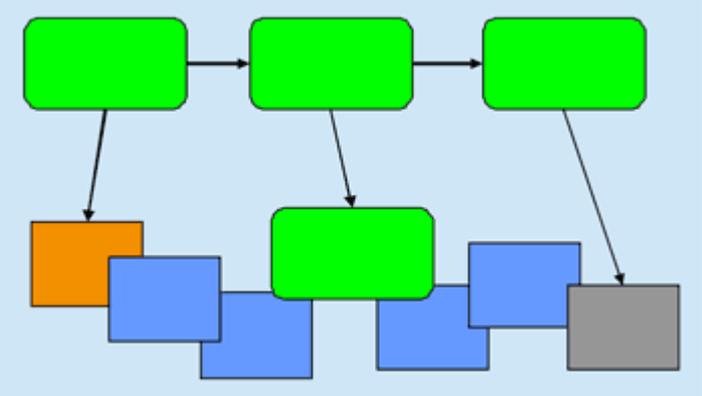
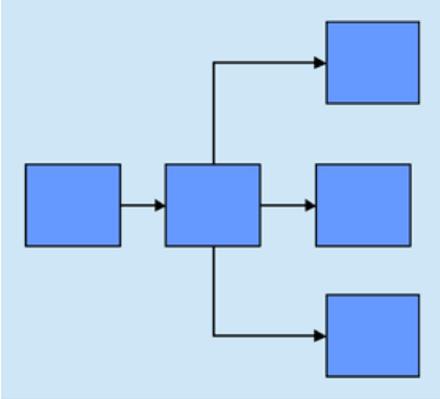| Pattern	Phase Applicability	Characteristics	Triggers
Exploit Tactical	Early Learning, Applied, Integration	SOA by opportunity Utility layer Selected Core Business Services	No compelling business case for SOA transformation Dominant Projects and Programs
Centralize Integration	Integration	Centralized responsibility for integration architecture Driven by momentum priorities Canonical data model drives rationalization Project to project integration eliminated	No overall case for SOA transformation Ongoing proliferation of integration is major issue – service anarchy
Core Business Services	Integration and Enterprise	Focus on Core Business Services Service Portfolio Plan Wrap existing applications Establish Service Platform or Acquire/upgrade Service Oriented Business Application (SOBA)	High level of duplication of application and business process portfolio Need for process and information consistency Multi-channel opportunity and problem Opportunity to rationalize existing portfolio
Business Scenarios	Applied, Integration	Opportunity to deliver improved solution for business process improvement project Reuse within project/program	Business improvement requirement No compelling business case for SOA transformation
Narrow Path	Early Learning, Applied	Create reference implementation Constrain broader SOA activity	Defined area of immediate business benefit No broader business case for SOA transformation Risk averse business
Service Domains	Enterprise	Business Units or Process Owners develop Domain Service Portfolio Combined business and IT transformation	Compelling business case in one area of enterprise May include provision of services outside the enterprise

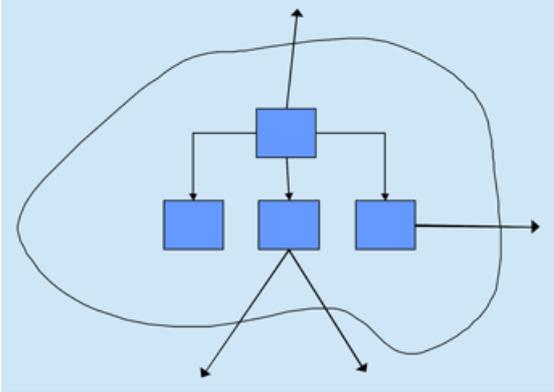**Table 6 – Summary of Adoption Strategy Patterns**

Pattern	Exploit Tactical
Synonym	Reactive SOA
Objective	Reduce or mitigate service anarchy, exploit momentum projects but exert minimum necessary structure and governance
Problem	A wide range of technical and business opportunity areas where service architecture can implement patterns that deliver benefits. Examples include – converged service to address data quality issues; wrapper services integrating disparate applications to provide users with common perspective . . .
Solution	Establish minimum necessary architecture and process framework to guide momentum projects. Implement minimum necessary governance to ensure it is applied.
Phase Applicability	Applied
Stream Impacts & Strategies	
Management	Funding, charging and project planning and chartering remains unchanged. Risk to long term goals, possibility of sub-optimal outcomes. However opportunity to demonstrate early stage SOA benefits with right encouragement.
Business Design	Minimal. Focus will be primarily IT searching out opportunities, which of course should have business value.
Service Architecture	By project. Recommend Service Architecture developed and subject to governance with a strong emphasis on avoiding duplication and encouraging reuse at all levels, not just services.
Infrastructure	Operational — Basic ESB required. Potentially also security, management and orchestration.
	Life Cycle — Basic registry essential to control service assets and usage.
Framework and Process	Minimum necessary reference framework and process to ensure common vocabulary, key deliverables and governance. Knowledge management environment useful to allow experience sharing.
Organization	Small scale CoE important to provide guidance and undertake limited coordination. Governance board required to manage compliance and also surface opportunities and find investment funding where project extensions are relevant to wider audience.
Projects and Programs	All project and program types are relevant.

Pattern	Centralize Integration
Synonym	Stop Proliferation
Objective	Stop proliferation of point to point integration; establish common services as a response to project demand.
Problem	Individual projects make point to point integration agreements with other projects. Result service anarchy.
Solution	Exert (at least) architectural control and governance over all integration activity.
Phase Applicability	Applied, Integration
Stream Impacts & Strategies	
Management	Funding of central integration architecture and any overhead to utilize common Core Business Services.
Business Design	Canonical data model required to optimize integration
Service Architecture	Data centric architecture identifies Core Business Services. Emergent SPP
Operational Infrastructure	ESB required
Life Cycle Infrastructure	Registry, metadata repository required
Framework and Process	Defined service specification and integration governance process.
Organization	Central responsibility for integration architecture. Governance board for integration intervention.
Projects and Programs	Requirement for compliance with central integration policy.

Pattern	Core Business Services
Synonym	Wrap and Replace
Objective	Establish single image, consistent service layer
Problem	Widespread duplication, inconsistency, inflexibility and maintenance overhead in existing application portfolio. Multi-channel opportunity and problem
Solution	Using façade pattern establish wrapper layer as Core Business Services that act as façade to existing applications and allow rationalization and potential replacement. Establish Service Platform or Acquire/upgrade Service Oriented Business Application (SOBA)
Phase Applicability	Integration and Enterprise
Stream Impacts & Strategies	
Management	Top down strategy to resolve major difficulties in current portfolio (duplication, tight coupling, extended release cycle time). Rationalization driven. Investment funding required.
Business Design	Canonical Business Concept and Type Models. Triage between Core and Context recommended.
Service Architecture	Service Portfolio Plan for Core Business Services, Utility and Underlying.
Operational Infrastructure	Full ESB, policy and management stack required to run mission critical business services.
Life Cycle Infrastructure	Full spec registry, plus integrated modeling tools
Framework and Process	Comprehensive reference framework required to manage high levels of interdependency
Organization	Core Business Service platform development team. Full governance board.
Projects and Programs	Assembly projects using comprehensive set of Core Business Services, achieving high level of reuse and reduced cycle time.

Pattern	Business Scenarios
Synonym	Business Services
Objective	Support immediate business priorities using SOA concepts
Problem	No compelling case for strategic SOA initiative. High priority to provide business projects and programs immediate support
Solution	Deliver process and capability services to support business improvement and integrate into existing application portfolio on tactical basis
Phase Applicability	Early Learning, Applied
Stream Impacts & Strategies	
Management	Business issue driven; Avoids SOA specific investment
Business Design	Business improvement modeling, business process and capability models
Service Architecture	Process and Capability Services.
Operational Infrastructure	ESB plus orchestration and management layers
Life Cycle Infrastructure	Registry plus modeling tools
Framework and Process	Defined approach for process and capability services.
Organization	CoE for process and capability service framework delivery
Projects and Programs	Solution projects using process and capability services to deliver agile business support.

Pattern	Narrow Path
Synonym	Exemplar
Objective	Deliver business value with SOA in constrained area of the business.
Problem	Widespread rollout of SOA to many concurrent projects represents significant business risk.
Solution	Constrain and focus structured SOA approach to a defined area of the business that will provide proof of concept and at the same time deliver measurable business value.
Phase Applicability	Applied
Stream Impacts & Strategies	
Management	Low, managed risk; Not fastest route to market; Probably CIO led
Business Design	Essential component of proof of concept
Service Architecture	Narrow view SPP – focused on chosen area of scope, with sufficient expansion necessary to stabilize and demonstrate creation of enterprise level service architecture
Operational Infrastructure	Full ESB, policy, orchestration and management stack
Life Cycle Infrastructure	Basic registry and repository may be sufficient for constrained scope
Framework and Process	The Narrow Path project will usually be designed to validate the reference framework and deliver a reference implementation that provides knowledge to subsequent projects and programs
Organization	Specific to Narrow Path. May be run by CoE, or by business team with significant assistance from the CoE
Projects and Programs	Service Architecture, Provisioning and Solution Delivery and Assembly

Pattern	Service Domains
Synonym	Service Oriented Business
Objective	Implement Service Architecture for a discrete domain
Problem	Business alignment with Service Architecture. Acquired Service Architecture (with Service Oriented Business Application).
Solution	Create SPP for domain and negotiate service specifications with other domains.
Phase Applicability	Enterprise
Stream Impacts & Strategies	
Management	Optimal approach for tight business IT alignment. Requires domain level investment. May be integrated business/IT program.
Business Design	Domain business design tightly integrated with Service Architecture.
Service Architecture	SPP for the Domain; models contracts with other domains
Operational Infrastructure	Independent of infrastructure
Life Cycle Infrastructure	Modeling tools, registry and repository.
Framework and Process	Framework may be specific to the domain – because it is acquired along with a SOBA, or because the domain architecture and business design are managed very independently
Organization	Probably domain centered – distributed responsibility for business design, architecture, service provisioning, governance and ownership.
Projects and Programs	Combined business and IT transformation. Also relevant to M&A situations. Service architecture, provisioning and delivery; solution architecture, delivery and assembly;

Capability Dependency. CBDI Journal May 2007. Useful analysis technique – relevant both to business requirements and also to SOA adoption

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