

Introduction to SOA

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Introduction to SOA

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Thesis

- SOA is something you do
 - Not something you build or buy
- SOA can deliver enormous benefits
 - But the risks are commensurate to the rewards
- Alternative is the status quo
 - Complex, inflexible, monolithic systems/ point-to-point connections
- Business/enterprise perspective required
 - Strategic planning and governance
- Plan for a 20 year maturity cycle
 - Existing systems, processes, and culture were not created overnight



Introduction to SOA

Agenda

- What is SOA?
- SOA risks and rewards
- Alternatives to SOA
- Enabling technologies
- Recommendations



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What is SOA?

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Service oriented architecture

- Architecture = style of design
 - Enterprise architectural style
- Service-oriented → the core unit of design is a service
 - Implementing a capability so that it can be easily consumed
- An approach to designing systems
- A set of design principles
- A way of thinking about a problem
- A mindset



What is SOA?

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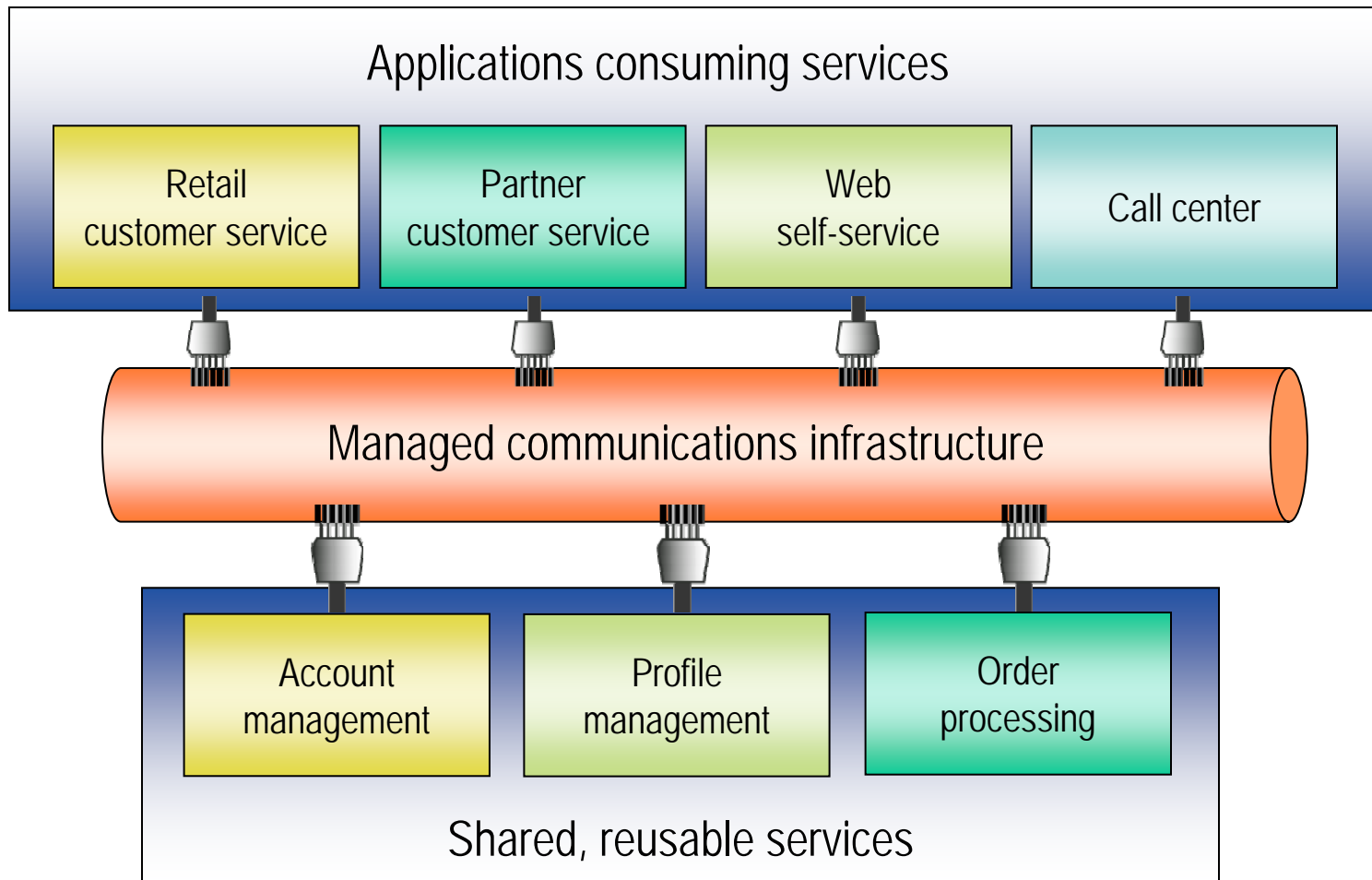
SOA from a technical perspective

- An architecture for designing systems
 - A "service" exposes a discrete capability
 - Any application that needs the capability uses the service
- A service exposes its capability via an interface
 - Standards-compliance improves its usability
- Compare against an application-centric design perspective
 - Monolithic application silos
 - Duplication of functionality and data



What is SOA?

Shared, reusable services





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SOA Risks and Rewards

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SOA from a business perspective

- Strategic business goals:
 - Align IT and business
 - Increase flexibility and agility
 - Gain competitive advantage



SOA Risks and Rewards

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Measurable benefits

- Improve the quality of applications
 - Give users better access to the information and capabilities they need
 - Increase productivity, efficiency, effectiveness, satisfaction
- Reduce time-to-market
 - Deliver new features, new capabilities faster
- Increase ease of doing business
 - Make it easier to integrate with customers, partners, and suppliers
- Improve consistency in systems
 - Externalize infrastructure functionality
 - Tighten security, ensure compliance
- Reduce costs



SOA Risks and Rewards

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Risks are commensurate to the rewards

- SOA is hard
- Disruptive to the status quo
 - Fundamental changes required
- Requires a long term commitment
 - Modest return in the near term
 - Significant return in the long term
- Many SOA initiatives will fail spectacularly
 - Derailed by cultural issues, not technology
- Systems may become more brittle and inflexible than ever before



SOA Risks and Rewards

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Cultural issues

- Current incentive systems discourage SOA
 - Deliver on time
 - Cost containment
 - Project control
 - Accounting and budgeting
- New incentive systems are required
 - Combination of carrots and sticks
 - Without them, passive-aggressive behavior will derail SOA initiatives
- May require organizational changes
 - Expanding the competency center model
 - Funding and charge-back accounting
 - Governance/ownership



SOA Risks and Rewards

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Fundamental changes required

- Design ramifications:
 - Different design focus (service rather than application)
 - Designing reusable services takes more time
 - Requires much more collaboration
- Accounting ramifications:
 - Who pays for initial service development?
 - How does a dev team recoup those expenditures?
- Control ramifications:
 - Hard dependencies on services that you do not control
- Operations ramifications
 - New applications may impact performance of existing apps

SOA Risks and Rewards

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SOA requires a cultural shift

- SOA is much more about culture than about technology
 - Technology provides the tools and raw materials, but it's up to you to use them effectively
- Current practices discourage SOA
 - Project-oriented approach
 - Time-to-market
 - Cost containment
- SOA is like physical fitness
 - It requires a lifestyle change





SOA Risks and Rewards

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SOA requires planning and governance

- Where do you start?
- How do you build services?
- Are you building the right services?
- Are your services reusable?
- Can people find the services?
- Who is using a service?
- Can you find the root cause of a problem?
- Who will be affected if you make this change?
- How do you know if the SOA initiative is generating ROI?



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Alternatives to SOA

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Status quo

- Complex, inflexible, redundant, monolithic systems
- Point-to-point connections
- Each new feature requires a huge effort
 - Integrating with other systems
 - Testing dependencies



Alternatives to SOA

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Status quo

- IT budget is enormous
 - >80% spent on maintenance
- Huge backlog
 - IT viewed as unresponsive
 - Results in missed opportunities
- Projects fail regularly
 - Late
 - Over budget
 - Never delivered

To fix IT, you need to change the way IT delivers software

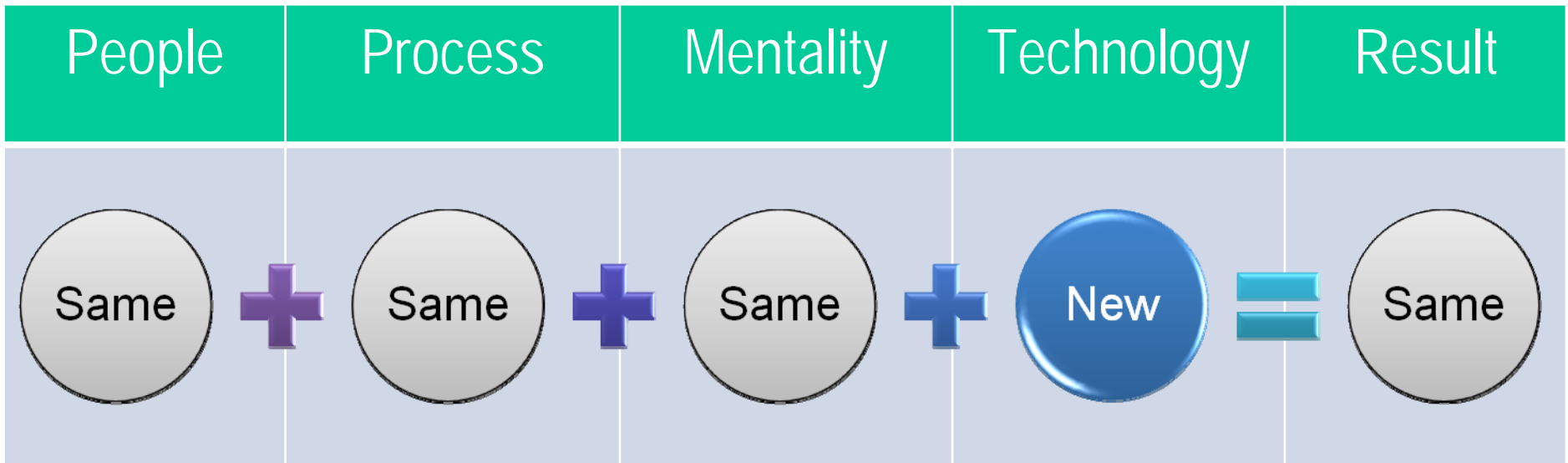
- A new technology will not fix the problem

Alternatives to SOA

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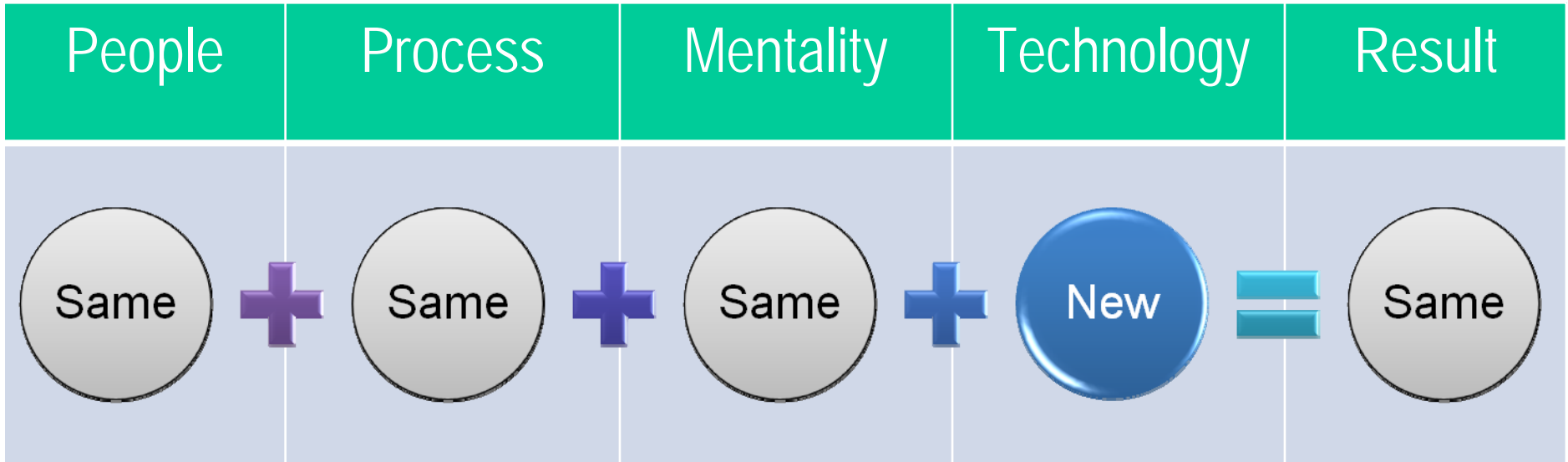
Technology != Change





Alternatives to SOA

Technology != Change





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Enabling Technologies

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SOA is about design not technology

- Any technology can be used to build a service
 - WS-*, POX/HTTP, MOM, CORBA, COM, Jini, flying monkeys, etc
- Technology will influence the power, flexibility, versatility, manageability, and resiliency of a SOA system
 - Choose wisely
 - Let requirements guide your choice
- Pervasive, standards-based technology = wider reach
 - Standard data formats (e.g., XML)
 - Standard protocols (e.g. HTTP, SOAP, APP)
 - Standard description languages (e.g., XML Schema, WSDL)



Enabling Technologies

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Isn't WS-* required?

- SOA is about system design, not technology
- 10 years from now, WS-* will be like CORBA
- But today ... one of the best options available

- Pervasive
- Gooding tooling and frameworks
- Reasonably interoperable



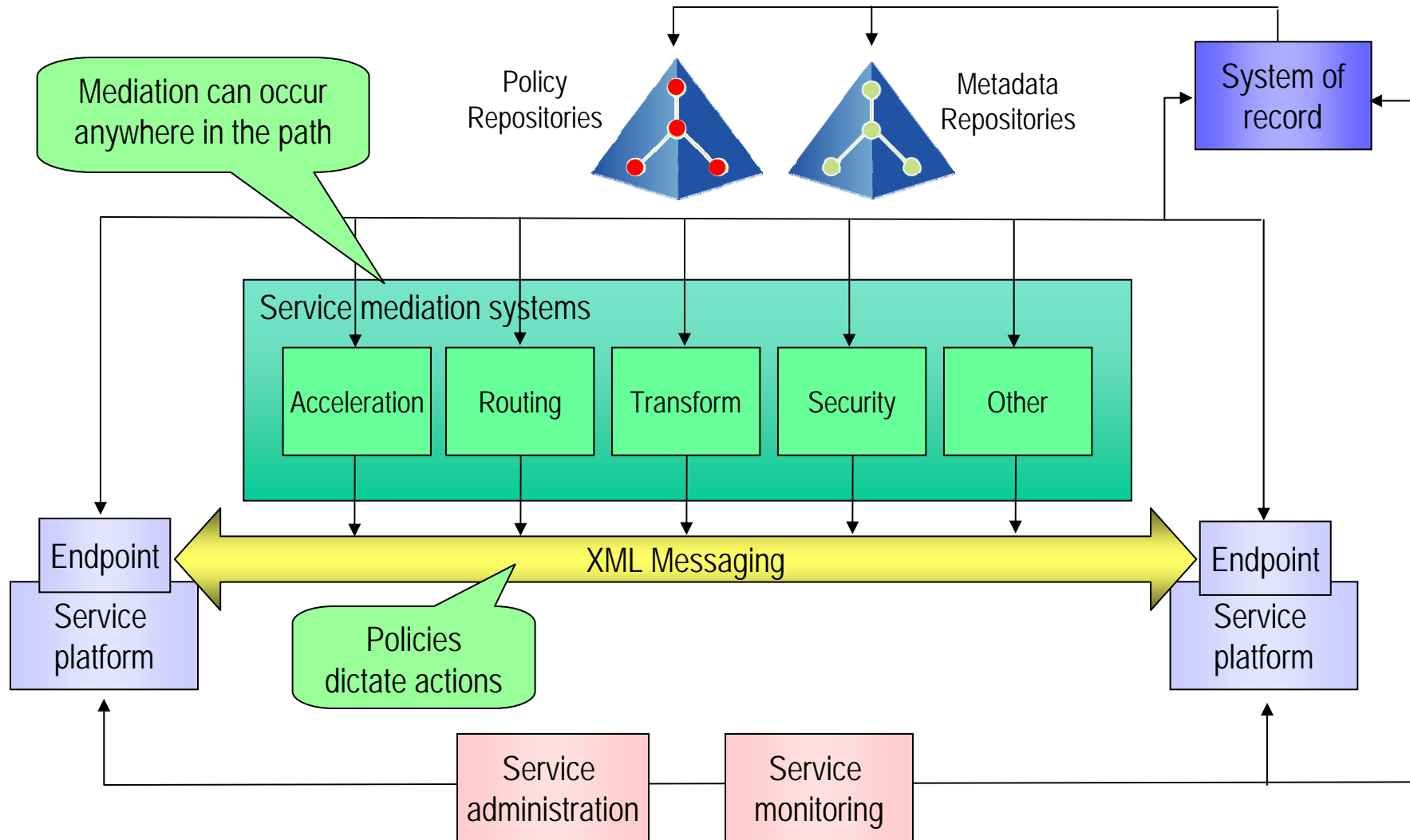
Enabling Technologies

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Middleware alone is not a complete SOA infrastructure

- SOA infrastructure comprises the products and technologies that enable service endpoints to interact
- Not just an ESB
 - Almost certainly will be heterogeneous
 - Requires more than what an ESB supplies
- Standards-based communications doesn't require a "bus"
 - Management and governance are more important than a bus

Functional model: Managed communications infrastructure





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Recommendations

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Recognize the scope of the initiative

- SOA is an IT-based business initiative
 - Make IT more responsive to business needs
- Requires rearchitecture of IT as a business
- It will impact all aspects of IT
 - Planning, funding, development, operations, utilization, and management of software



Recommendations

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Are you prepared?

- SOA is a long-term journey
 - It requires a significant investment to realize big benefits
- Take time to do a self-assessment
 - Understand your impediments and priorities
- Plan your course
 - Build a SOA maturity model



Recommendations

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Don't kid yourself

- If you aren't prepared to make the investment, don't pretend to be doing SOA
 - Focus on service-oriented integration instead
 - Less benefits, but a lot less risk
 - Be careful not to make things worse with lots of unmanaged web services



Recommendations

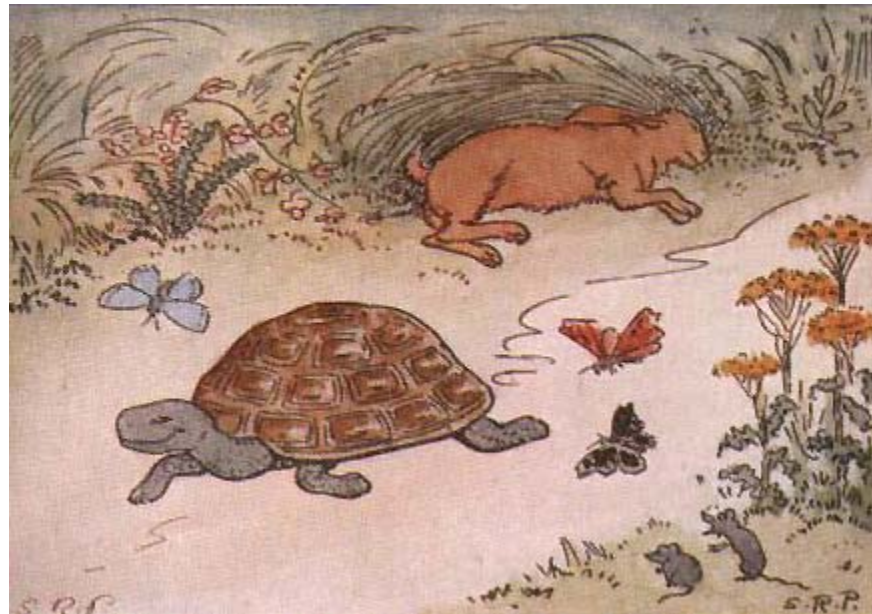
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Think big

- Develop a SOA adoption plan
 - Plan for resistance and misunderstanding
 - Education, evangelism, and mentoring is required
- Infrastructure alone won't guarantee success
 - There's no such thing as "instant SOA"
- Define policies, guidelines, and best practices
- Institute governance processes and tools
- Establish new incentives that reward SOA

Take small steps

- Define achievable objectives
- Deliver incremental value



Recommendations

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Chart a course

- Prioritize projects
 - Low hanging fruit
 - Big business issues
 - Prerequisite infrastructure
- Keep the scope contained
 - Make sure the objectives are achievable
 - Work in <3 month intervals





Recommendations

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Selecting projects

- High visibility
 - Strong business incentive to improve a painful business process
- Reasonable potential for reuse
 - E.g., supporting a new regulation, infrastructure functionality, common business function (especially one that changes frequently)
 - Make sure that pilots challenge the cultural and organizational issues
 - not just the technology issues
- Manageable scope
 - Improve chances of success



Recommendations

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Concentrate on governance

- Governance applies to all stages
 - Project selection
 - Requirements management
 - Design and development
 - Release engineering, testing, staging, deployment
 - Operations, management, runtime enforcement, SLAs
 - Service utilization, incident management, change management



Recommendations

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Governance must be helpful, not a burden

- Governance processes should be as automatic and painless as possible
 - Automatic compliance checking during code check-in or build
 - Integration with tooling to make it simple for developers to identify and fix compliance issues
- SOA governance infrastructure can help
 - Registry, repository, policy management, runtime management and mediation systems



Conclusion

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SOA can deliver enormous business benefits

- Flexibility and agility
- Simpler, faster integration

Success depends on good planning

- Deployment of new infrastructure
- Education and mentoring
- Different incentive systems
- Strong governance program

Success also depends on delivering value



Think big
Take small steps





References

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- VantagePoint 2006-2007: Back to Basics
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- Enterprise Architects: Sowing the Seeds of SOA Success
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- Application Rationalization: Burning Fat and Building Muscle

For access to these documents and others, contact

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- Service-Oriented Architecture (SOA) Templates
 - Managed Communications Infrastructure
 - Infrastructure Services Model
- SOA Runtime Infrastructure Technical Position

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