

Achieving a successful SOA implementation Huibert Aalbers

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IT Insight podcast

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Three phase plan to a successful implementation

- phases
 - Planning
 - Enterprise Application Integration
 - Business Process Management

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• No matter wether you are just starting dabbling with services or have solid experience developing distributed components, a successful SOA implementation requires every organization to go through three consecutive

- \bullet In particular, it helps to answer the following questions
 - What is a service?
 - What services are needed?
 - Which services need to be developed?
 - How to create new services?

 - How should services be managed?
 - Vocabulary normalization

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Phase 1 - Planning

Before starting to create and connect services you should spend some time planning.

Which communication protocol should be used to invoke services?



What is a service?

- A service represents a clearly defined business task that can be remotely invoked using standard communication protocols
 - A function such as SRQT(x) is not a service
 - The function LogErr("Unexpected error") isn't a service either
 - A service is defined by an interface (WSDL) that is totally independent of service implementation

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What services are needed?

processes



• IT should not answer this question. Instead, the best way to find out what services are needed is to ask business users to model their business

Which services need to be developed?

- system, exposed as a service
 - web services
 - Message queues
 - Adapters
 - Direct database access, etc.

 For each identified service you need to ask yourself if it needs to be created from scratch or if it is possible to reuse functionality provided by a legacy

There are many ways to expose the functionality of legacy systems as







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How should new new services be created?

- Currently most programming languages offer support for web services
 - However, it is easy to discard most of them for various reasons (obsolete, proprietary, complex, etc.)
 - From my point of view, Java is he best choice to produce enterprise-ready services (in particular if high-availability is required)
- Services are programs, therefore developers need to use proven methodologies to develop them
- One of the main advantages of working with services is that these components can easily be unit-tested. Consider testing both functionality and scalability



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Which communication protocol should be used?

- achieve this goal is to adopt a loosely- coupled architecture
- message queues
- alternative
- various transport protocols

• A highly distributed system needs to be fault-resistant. The best way to

• This can be achieved by connecting asynchronously components using

• However, in some cases, for example online queries, it may not be possible to use asynchronous communications, and then HTTP becomes an

• It is important to consider that it is very easy to expose a Java component (for example an EJB or a Java Bean) as a service that can be invoked through





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How should services be managed?

- With few services, it is theoretically possible for the developers to manage the WSDL files themselves
- When working with tens of services, it becomes necessary to have a centralized repository (UDDI) that stores and publishes information (WSDL) about the existing services
- If a company uses hundreds or thousands of services a more advanced directory is required in order to know
 - Who is responsible for a particular service (QoS)?
 - Who maintains a particular service?
 - Who is responsible for data quality? \bullet
 - Which processes will be impacted if a service fails?



Advancing Web Services Discovery Standard

Vocabulary Normalization

- within different systems
- costly transformations when connecting multiple systems

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• When trying to interconnect tens of different systems, it is usual to find out that all of them do not share a single dictionary. The same object, for example "Customer" or "Address", can be represented in different ways

• It is important that during process-modeling, business objects get normalized, in order to simplify system integration and reduce the need for



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Phase II - Enterprise Application Integration (EAI)

- (ESB) and therefore you need to consider
 - Message transformation and routing
 - Security
 - Monitoring
 - Quality of service

• This phase involves connecting services through an Enterprise Service Bus





Message transformation and routing

- services to the processes that run the organization
- and XPath



• These functions are provided by the Enterprise Service Bus (ESB), which is really a secure communication infrastructure that allows to connect all the

 The ESB is built by connecting message queues and brokers that transform and route messages based on their content using standards such as XSLT



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- Security is extremely important within the web services context
- You can either encrypt the messages or the communication channel
 - It is easier to encrypt the whole communication channel
 - By encrypting the message or parts of it using WS-Security, developers get much more flexibility
- Security should be centralized
 - Use an LDAP directory

Security

Always remind that security can seriously impact an application performance





Monitoring

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Any SOA architecture is as solid as its weakest link

- One of the main missions of architects is to plan from the beginning how the final system will operate and will be monitored in order to insure a quiet and trouble-less operation





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Quality of service (QoS)

- Besides being able to quickly detect problems it is important to ensure those problems will not disrupt the business operations
 - The best strategy is to have each component in high- availability
 - Portal
 - Process engine
 - Application Servers (used to run the services)
 - Database \bullet
 - Message queues, brokers, etc.
- Quality of Service also covers response times

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Phase III - Business Process Management (BPM)

- After implementing the ESB
 - Separating the presentation layer from the business logic layer
 - Developing process-based applications
 - Business Process Monitoring

Separating the presentation layer from the Business Logic layer

- each one maintains its own user interface

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Under an EAI design, applications communicate between each other but

• After moving to the next phase, those user interfaces are usually deprecated, instead all user-interactions are consolidated into a single web-based portal

• This allows to put the presentation layer on the portal, which facilitates single sign-on, run the business components on the application server layer and finally move all the processes to the process engine. This allows for development simplification and separation of concerns



Developing process-based applications

- simply connecting services to business processes
- Making changes to a business process becomes trivial, since there is no need to modify any code



 After proper planning and developing new services or exposing as such existing functionality, it becomes possible to create new applications by



Business Process Monitoring

- order to find ways to improve the business
- situation of the business



• When the processes are run, it is possibles to monitor and analyze them in

Using BPM the upper management can see in real-time, through the



Implementing SOA is a long and complex process that cannot be achieved quickly

- many factors
 - Security
 - Performance
 - Monitoring \bullet
 - Governance \bullet

Conclusions

• When designing a highly distributed architecture it is necessary to take into account

Despite the fact that SOA based systems are complex to operate, the many advantages brought by this new architectural pattern highly overcome the disadvantages



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