



SNAPSHOTS FROM SOA GOVERNANCE

A WHITE PAPER ABOUT SOA GOVERNANCE USING CENTRASITE

CONTENTS

Introduction	2
1 First meeting of the SOA Governance Board: the Pilot	3
1.1 Service Design	3
1.2 Versioning and Orchestration	6
1.3 Business-side integration: Business Analyst redesigns a business process	9
2 Second meeting of the SOA Governance Board: Adjustment & Extensions	12
2.1 Measuring process change durations	12
2.2 Services with external consumers	14
2.3 SOA Architect revisits the Information Model	16
2.4 Extending the governance processes	18
3 Third meeting of the SOA Governance Board: Alignment	19
3.2 Process Efficiency	20
3.3 SOA Infrastructure Enablement	21
3.4 Business Innovation	21
3.5 SOA Governance	22
4 Summary	23

INTRODUCTION

This white paper is part of a collection of documents about SOA Governance provided by Software AG and the CentraSite™ Community¹. Here we develop several use cases using the general discussion in *SOA Governance: Rule your SOA*² as a foundation, going into more detail about the benefits to be realized with a Registry/Repository such as CentraSite, the role SOA Governance has on SOA artifacts and how people connect during the process of implementing SOA Governance.

Our aim is to provide concrete examples that evolve using a fictitious company with actors, sample processes and organizational structures that are *inspired* by real-world scenarios and our experience with many customers.³ So let us briefly introduce you to our company and actors:

Like many other companies, BetterWidgets Inc. has entered the world of services via two roads simultaneously:

- 1. IT-driven:** The IT department has introduced several Web services to integrate applications, and is relatively enthusiastic about the simplicity and technical appeal of the approach.
- 2. Business-driven:** Upper management could not help but notice the SOA hype, despite some hesitation and skepticism about new paradigms that may generate considerable reorientation costs and uncertain business ROI.

Chris recently joined BetterWidgets Inc. and its executive board as the new CIO. One of his first projects is an SOA evaluation; its conclusion: the technical Web services evolution should be matched by a corporate strategy with an explicit focus on SOA Governance right from the very beginning.

Chris already knows from his experience that, first and foremost, SOA Governance needs organization, so he establishes an initial set of SOA roles and an SOA Governance Board.

Chris also knows that IT Governance is dependent on tools and infrastructure that facilitate compliance with an overall strategy. That is why he decides to support the initial SOA evaluation project's recommendation for CentraSite as the SOA Registry/Repository.

¹ www.centrasite.com, CentraSite is co-developed by Software AG and Fujitsu

² This white paper is available at www.softwareag.com/soagovernance

³ Any similarities to any real persons or events in the past, present or future are unintentional and coincidental.

1 FIRST MEETING OF THE SOA GOVERNANCE BOARD: THE PILOT

Chris establishes the initial SOA Governance Board with Sam (the Chief Architect), Luke (the Librarian) and himself as founding members. Later he plans to extend the board and have his team manage the operational aspects, but first he wants to ensure the strategically important project is securely headed in the right direction.

In their first SOA Governance Board meeting Sam, Luke and Chris decide on an SOA Governance Pilot – a project that will follow the newly established SOA rules and guidelines. They find a suitable use

case in the OrderTransaction business process redesign project that is scheduled to start very soon. They plan to have it redesigned in a service-oriented way and managed by CentraSite, focusing on three aspects:

- Service design
- Versioning and orchestration
- Business-side integration

BETTERWIDGETS INC.'S SOA ROLES AND REPRESENTATIVES:

Chris (CIO): Responsible for the overall IT Strategy; introduces SOA Governance; Governance Board initiator.

Sam (Chief SOA Architect): Designs and enforces the overall IT Architecture; customizes SOA principles; Governance Board member.

Luke (SOA Librarian): Responsible for service registry content and consistency; fields requests and day-to-day tasks; approves registry additions and changes, and enables registry federation; Governance Board member.

Barbara (Business Analyst): Business Process Designer; owns the Service Design business requirements; joins as a Governance Board member before the end of the pilot.

David (Service Designer): Responsible that Service blueprints meet the business requirements and established customized SOA principles of BetterWidgets Inc.

Conrad (Consumer Application Developer): Uses pre-existing published services and assets, and builds composite applications and services with them.

Martin (Operations Manager): Maps the service logics to the operational IT Infrastructure; responsible for runtime policy enforcement.

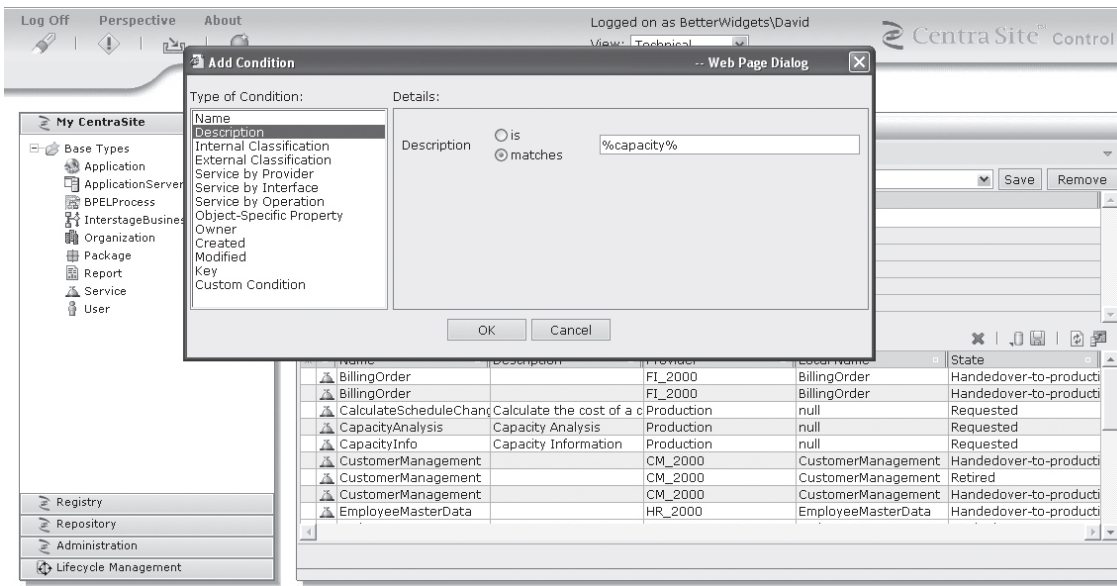
Key Topics	Business Benefits
<ul style="list-style-type: none"> - Establish SOA Governance Board early - Include key people - Define and publish your SOA goals - Carefully select pilot project and tools - Establish key rules, processes and guidelines - Define roles and responsibilities 	<ul style="list-style-type: none"> - Provides a good foundation and guidance for SOA and SOA Governance from the beginning - Incrementally integrates SOA Governance to promote a governance-friendly culture across the organization - Creates upper management visibility - Selects/supports effective processes and tools - Gets “buy-in” from key people

1.1 Service Design

David	Service Designer	Designs new business services by composing existing services
Luke	SOA Librarian	Promotes service reuse

BetterWidgets Inc. has introduced a new service design procedure that leverages CentraSite’s SOA Registry capabilities. As part of the kick-off briefing, David was assigned the role of a *Service Designer*. The sales department has requested some additional last-minute, business-critical requirements for the order entry procedure that will need to be incorporated into the upcoming version of the OrderTransaction process.

Reviewing the requirements with the author Barbara, the Business Analyst, David is reasonably sure he understands what is needed. He begins the design process by searching the existing services portfolio for a suitable service reuse candidate. In the kick-off briefing Luke, an experienced senior service developer who was recently promoted to *SOA Librarian*, had stressed to David that most of the “new” business requirements were actually not new from the developers’ point of view. In many cases existing services could be combined and perhaps extended to meet the “new” requirements. This was consistent with David’s experience in that reuse has been a well-known principle since the times of “structured application development,” yet the historical software structure had always lacked transparency, there was no systematic encapsulation of modules and integration was a mess with proprietary APIs (or no APIs at all). Luke had also noted the granularity and technical nature of API operations did not address business process-related functions, but Sam (*Chief SOA Architect*) had assured them that consistent SOA Governance could overcome these issues. David starts off his search by looking for a service that supports order processing in a sales context.



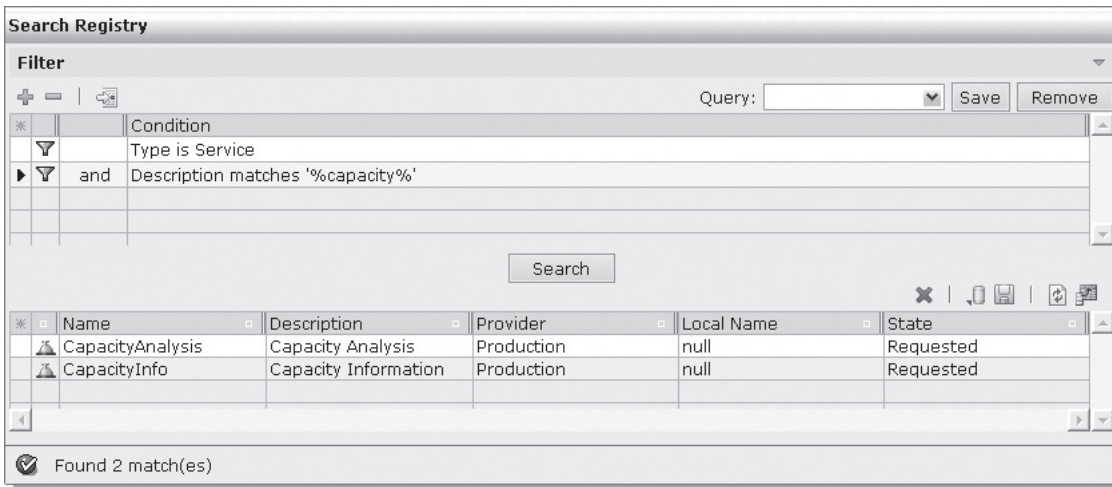
SCREEN 1 Service Designer searches the registry

David tries out some different approaches; first browsing the company-defined Internal Classifications, noting that the categories “Order” and “Entry” are both in the classification taxonomy. He selects both for his search and finds that the first is subcategorized as a “business object” and the second has two subcategories “data” and “activity,” but there are no related services. David is not surprised, as their company classifications for Web services and other related metadata are still in their infancy.

Next he tries using keywords from the business requirements as Description search conditions (“customer allowance” and “product description”) and receives a list of services, including:

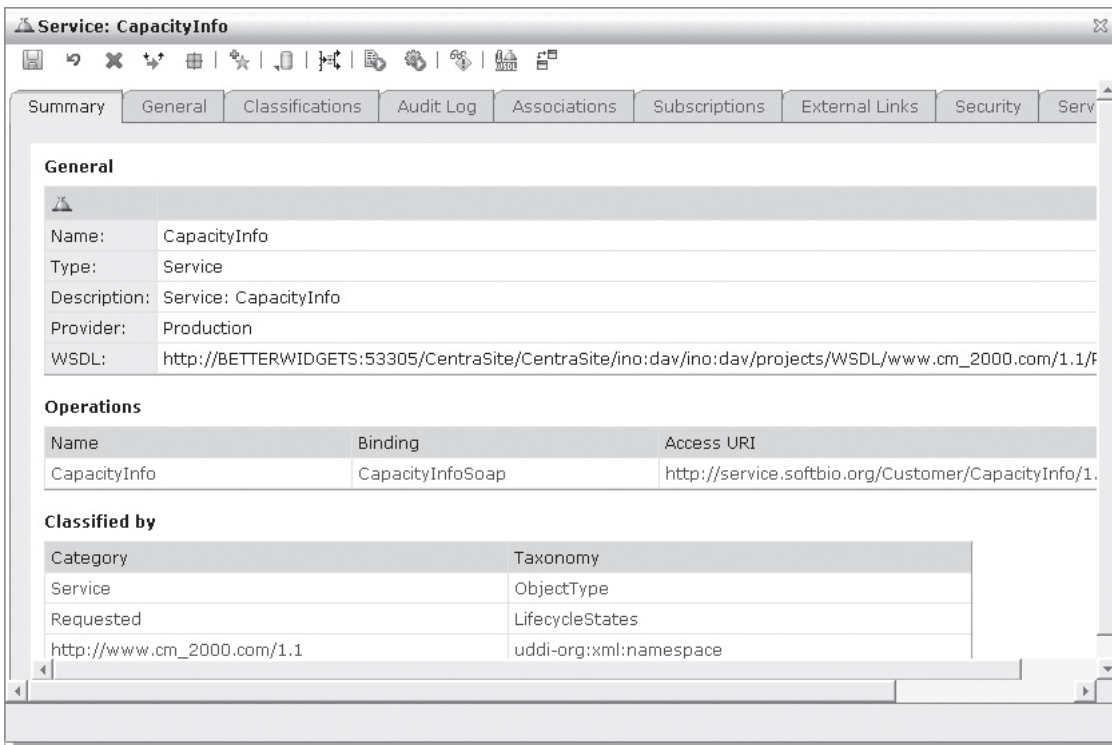
- CustomerManagement
- ProductCatalog
- CapacityInfo
- ...

This list of services is much longer than David expected, however it gives him an idea – so he changes his keyword search condition to “capacity” (SCREEN 1), and finds two related services (SCREEN 2).



SCREEN 2 Search results – object attributes

The results list provides some descriptive attributes for each service (SCREEN 2). Double-clicking on a service “drills down” and opens the associated detailed metadata dialog. Each base type, or metadata artifact, has a unique set of attributes that describes it; these attributes are categorized and grouped into a set of folders – the detailed metadata dialog – which gives each base type its standard structure. In the case of a service, the detailed metadata dialog groupings are: Summary, General, Classification, Audit Log, Associations, Subscriptions, External Links, Security, Service Bindings and Policies (SCREEN 3).



SCREEN 3 Service Designer examines existing services for reuse

David drills down and examines the metadata from both services, including the structure of their interfaces (SCREEN 3). It is clear that he can reuse both services, so he formulates his ideas of how he will compose them and what additional logic will be needed to meet the business requirements for the new OrderEntry service. David continues to browse related services (SCREEN 1) in order to find all related information for his new service.

In the process, he has noted there is some mismatch: OrderInfo identifies products ordered based on the *catalogNumber*. The *catalogNumber* is obtained from the ProductCatalog service, which is maintained by the marketing division. The CapacityInfo service is maintained by the production division to report the manufacturing capacity of a certain *part* in a given time period. CapacityInfo expects a unique *materialNumber* as an input, not a *catalogNumber*. David realizes that each product in the catalog is composed from several parts and he really needs to know the *product information*, not just the *part information* for his OrderEntry service. So he creates a change request to extend CapacityInfo so it will support a *catalogNumber* as an input as well.

Now that he has decided upon the principles of the OrderEntry service design, he is surprised – all this took him less than an hour! He can perfectly remember several similar cases when the information gathering alone took days. He understands now why Chris introduced CentraSite, and he continues his work by publishing his OrderEntry blueprint to the registry.

From the menu he selects, “Create new service” to open a metadata dialog. He briefly describes his plans and registers the proposed enhancement as a new business service named “OrderEntry” with status “requested.” Then he links it to the services that he intends to reuse. Sam had explained to him the set of named associations used in CentraSite so far (hinting that they might be extended later). In this case, David creates “isConsumerOf” associations pointing from “OrderEntry” to each of the services to be reused. Then he links the new service request to his change request for the CapacityInfo service. Having experienced the significant benefits of discovery in his search experience, David elaborates on his classification and descriptive metadata to enable others to do the same.

Once David has saved the new service description, CentraSite sends an automatic notification to subscribers of business service changes and to the stakeholders who will review his design proposal for approval. David is quite impressed with the new design approach, so he describes his impressions and results more closely in the corporate discussion forum, including a link to the registry metadata. A few hours later, he finds several comments in his mailbox, some of them containing valuable proposals on some details, but one person is not so happy...

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Assign roles as needed - Service discovery - Service design 	<ul style="list-style-type: none"> - Begins adoption of SOA Governance using a real business case - Improves business alignment using SOA Governance and tools to speed the process

1.2 Versioning and Orchestration

Conrad	Consumer Application Developer	Develops a consumer application where the changes would currently be too risky
David	Service Designer	Designs a non-breaking (“backwards-compatible”) version
Luke	SOA Librarian	Helps with a solution
Sam	Chief SOA Architect	Approves David’s requests

Conrad, an application developer in the production division and a subscriber to news about services provided by his division, has been notified by CentraSite about David’s change request. He maintains production planning applications that make extensive use of the CapacityInfo service in the simulation of production plan variants. The current business campaign relies heavily on the production planning

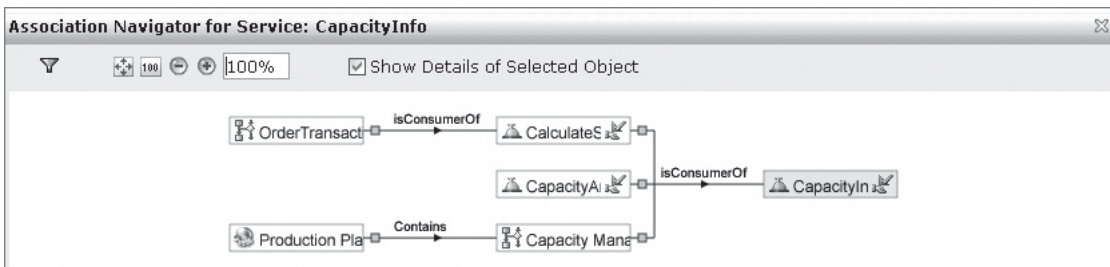
department's applications, so a sudden change in one of the underlying services, such as CapacityInfo, would be too risky, from Conrad's point of view.

Marked in CentraSite as the "owner" of an application that consumes a service to be modified, he has the right to veto the change, so he adds his comment to the change request. He notes that the application cannot be modified earlier than the next periodical maintenance step, which is planned to take place five months from now.

As the change request author, David is automatically notified by CentraSite whenever someone adds a comment to his request. So he is able to respond almost immediately. He thinks it over ... five months? Sales cannot wait, so there must be some other solution conforming to both divisions' needs. This is a rather typical problem, however David would like to make sure that he is following the new governance approach, and he decides to discuss the issue with Luke, the SOA Librarian.

Luke provides a rather detailed explanation: "Generally there are two approaches: either you find a backwards-compatible solution for your proposal, in which case you can simply update the CapacityInfo service without any ill-effect for the consumer. Requests conforming to the old format will be redirected to the new version, automatically. This is what we call a minor version, intended for "non-breaking" changes. If this is not possible, you will need a new major version which is incompatible with the current consumer version. In this case both versions have to be maintained simultaneously until all consumers have finalized their updates as well – so let's see who will be affected."

Luke looks at the service metadata and those "isConsumerOf" associations that reference the CapacityInfo service. "It looks like CapacityInfo doesn't have too many consumers. But some of them are business services just like yours; so many applications might be affected indirectly. Let's apply the CentraSite impact analysis to detect all the affected applications." (SCREEN 4)



SCREEN 4 Graphical Impact Analysis detects all applications affected by a service change

Luke examines the results of the analysis with David. "As you can see there are many applications affected, and a breaking change would be costly. But in certain cases it may be just necessary. Let me think whether this case can be handled in a backwards-compatible way ... tell me again: what's the nature of the change?"

Discussing the relationship between catalog products and parts manufactured, they come to three conclusions:

1. Updating the CapacityInfo service to support *catalogNumber* as input parameter could be done in a backwards-compatible way so that existing consumers could continue to use *materialNumber* without any change to their interface.
2. The problem should not be solved by an update of CapacityInfo at all – for two reasons: The catalog products are more dynamic than the manufactured parts, and the mapping between the two is not relevant to the manufacturing capacity.
3. There must already be such a "mapping function" somewhere in the company – otherwise catalog products could never be bundled and delivered. "Probably this is one of those Excel sheets exchanged via e-mail," Luke surmises, "we'll have to track this down."

The solution they agree on is to create a Cat2Mat mapping service so that a *catalogNumber* could be used to return the corresponding set of *materialNumbers*, using multiple calls of CapacityInfo to meet the specific product requirements.

They also discuss some variants for orchestrating these services. The OrderEntry service could call the Cat2Mat service once and the CapacityInfo service for each part returned (see Figure 1) and they could aggregate the results somehow. However they realize this might not be that trivial. They expect other business services to need this method as well, so they decide there should be a second dedicated service.

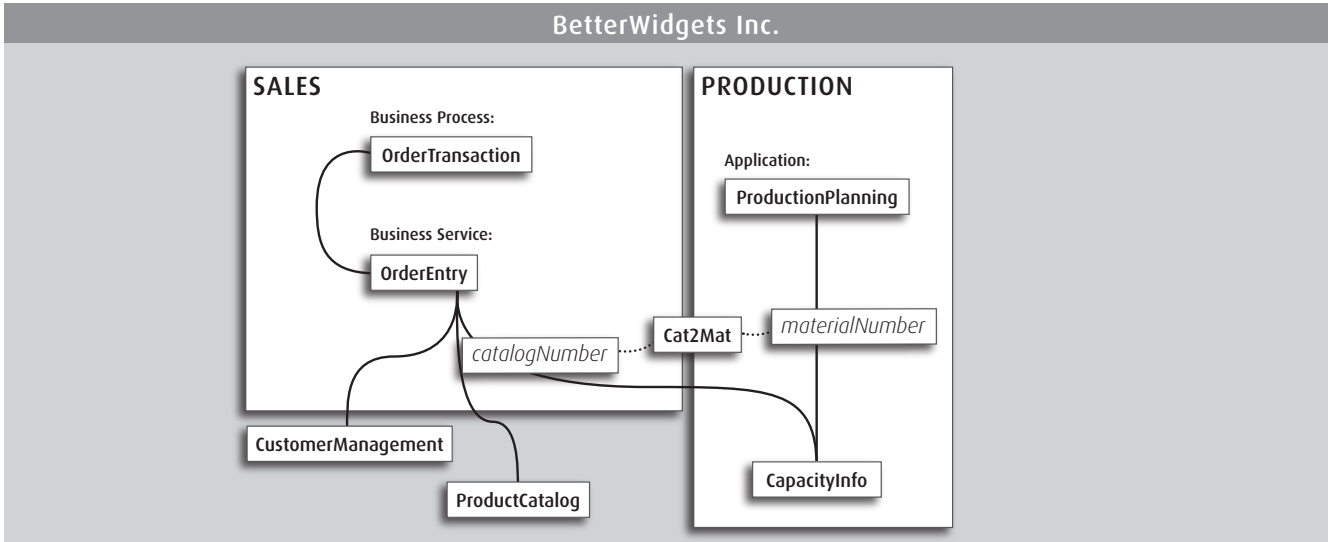
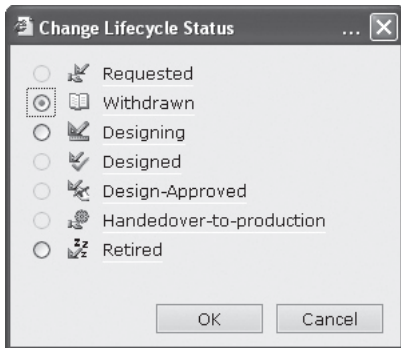


Figure 1 Overview of the Pilot Scenario

David and Luke agree that the final orchestration will need more clarification of the overall process structure and implementation. Who should be the provider of such a service? As it also relates to product composition, part bundling and delivery, these process steps might benefit from a service-oriented redesign as well. For now they confine themselves to entering their plans in CentraSite and scheduling a review with Sam, the Chief SOA Architect. Since BetterWidgets is still in the early SOA adoption phase, Sam wants to ensure that development starts off solidly in the right direction and make sure services are reused properly from the beginning. He knows there is nothing more frustrating than searching for a service, only to find five different variants and you don't know which one to use; each returns slightly different results and needs maintenance. Sam reviews Luke and David's plans, checking that the service creation and reuse guidelines are met. He is satisfied with the quality of their research and work, and gives his approval.

Now that their review with Sam is complete and approved, David sends a short note to Conrad including a pointer to the solution they found. Then he closes his CapacityInfo change request by setting the lifecycle status to "withdrawn." (SCREEN 5)



SCREEN 5 Lifecycle status flags can be customized

Luke and David create the Cat2Mat service with status “requested” and enter a short textual summary of their discussion. Next they add an “isConsumerOf” association from OrderEntry to Cat2Mat.

Luke schedules a meeting with Barbara (the Business Analyst) to provide some initial CentraSite support; he considers this a good opportunity to go over his ideas with her before preparing a concise proposal.

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Service reuse - Service design and change 	<ul style="list-style-type: none"> - Sets initial standards for internal cooperation, collaboration and conflict resolution - Promotes reuse and sound service design - Encourages and supports desired behaviors

1.3 Business-side integration: Business Analyst redesigns a business process

Barbara	Business Analyst	Owens the business requirements; gets involved in SOA Governance by redesigning a business process
Luke	SOA Librarian	Provides support for using CentraSite and integrated SOA tools

Barbara, a *Business Analyst*, has to redesign the business process of OrderTransaction. She also authored the requirements for David’s new OrderEntry service, and she is one of the stakeholders who will have to approve his service design to ensure it complies with the OrderTransaction process.

She has very clear ideas and is already used to business process diagrams and formal descriptions, but only did it “on paper” before. Certainly she is used to computer programs in her work, but her output has been documents and presentation slides in the past, and the implementations for these processes in the supporting IT systems has always been very difficult to control.

Luke (the SOA Librarian) had spoken of the challenges in describing processes in a directly executable way, using BPEL. Barbara finds BPEL a rather cryptic language and would rather not learn it. So Luke showed her that the BPEL graphical process design tool he had integrated with CentraSite could be used in two easy ways:

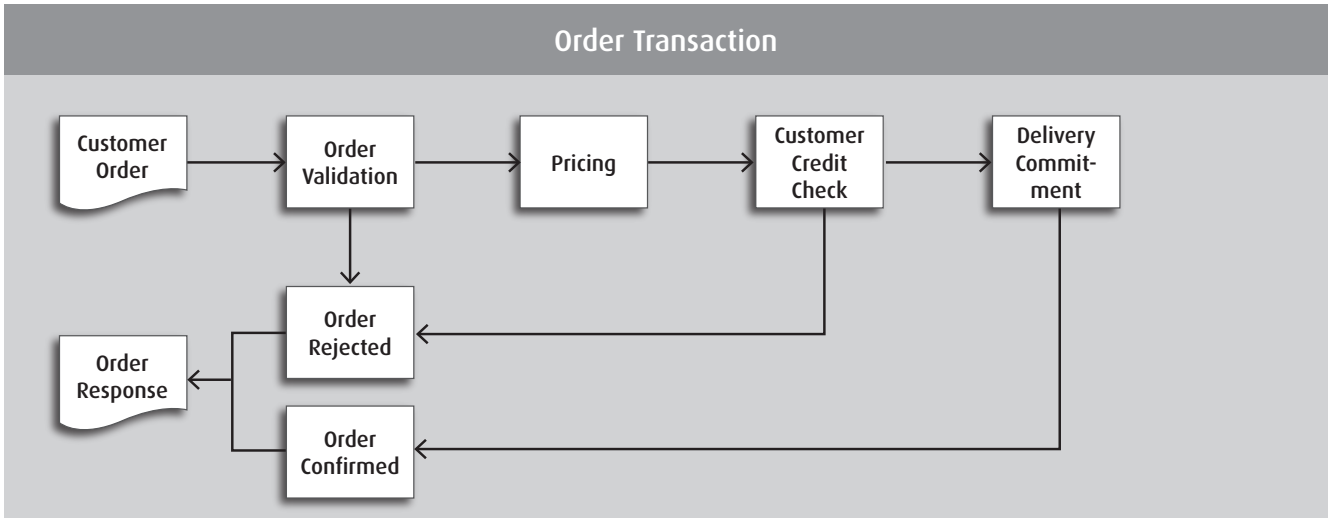
1. By artifact: the “files” generated with the process designer tool (by pressing the save button) are actually managed registry artifacts just like Service Descriptions (WSDL), Schema Definitions (XSD) or even informal descriptions of requirements in a Word document. This gives Barbara the possibility of using all the general features of CentraSite, such as versioning support and authentication, with her process design objects. In addition, Luke could add descriptive metadata, typed associations and categorizations based on an overall corporate taxonomy to provide her more ease of use.
2. By application: the graphical editor can be executed from the CentraSite user interface. Whenever a business process artifact is selected in the registry dialog, the graphical tool can be started by a simple double-click. To Barbara, this looks like a single powerful application.

In Barbara’s case, there is no executable artifact as the current process design exists only in a graphical format, not in a machine-executable form. If they are lucky, their graphical tools will provide a structured, standards-based export format, such as BPEL. However, this is a typical tool migration scenario, not an SOA Registry integration topic. In any case, it makes more sense to integrate a BPEL-aware tool with an SOA Registry than a somewhat “intelligent” drawing program.

Luke considers leaving the current version of the process definition unchanged; he would rather create the new version from scratch with a new tool. In some cases this might be the easiest way to proceed, especially when there is a one-time migration of only a few

objects. With CentraSite you can store the “drawing” as the managed artifact for version 1 and BPEL object for version 2. Luke would have to explicitly grant this exemption in the CentraSite configuration, but that’s not a problem.

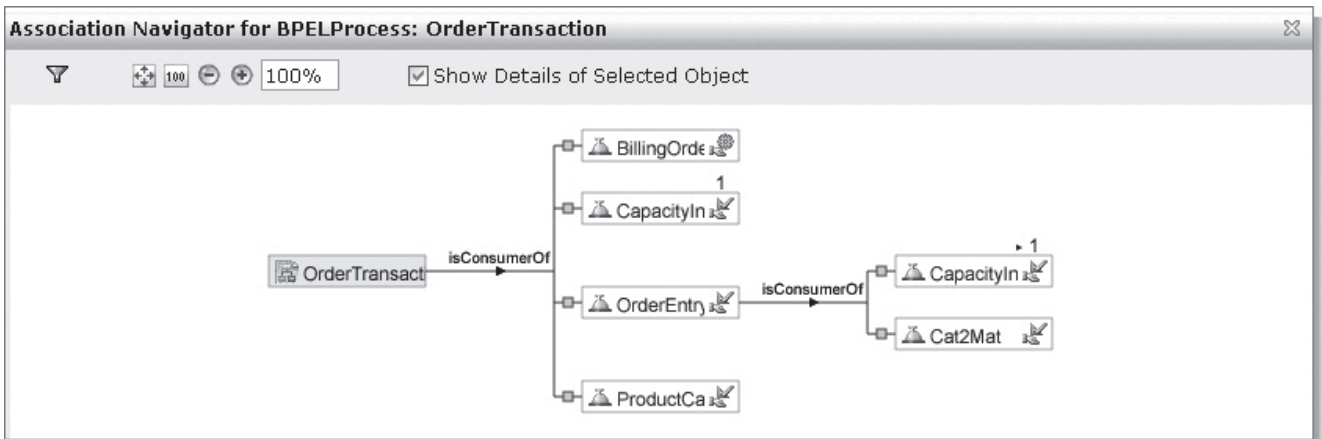
Together they create Barbara’s process using the new BPEL tool to give her an idea of how it works. Now, Barbara looks at the new graphical process model for the OrderTransaction Process (SCREEN 6), comparing it to the printed version of her former draft.



SCREEN 6 Graphical process model with comments

While she misses some well-known graphical features of her “old” program, Luke shows her that she now has the ability to link David’s OrderEntry service to her process model by using a resolvable association to the external business service.

They create this association and Luke recommends they look next at the graphical impact analysis. For the impact analysis they select: “show all types of associations in two levels,” and immediately Barbara sees a concise visualization of how her process “calls” the business service, which in turn “calls” the base services. (SCREEN 7)



SCREEN 7 Graphical Impact Analysis

“Remember this is more than a presentation slide,” Luke reminds her. “What we have created so far is the skeleton of an executable process and it still needs some refinement. All this is about moving from drawing to modeling.”

“Well, I hope so,” is Barbara’s response. But nevertheless she feels this new experience is a positive challenge. “OK, I’ll never care for the computer syntax, but I’m curious about semantics and enforcement of models.”

This reminds Luke of the catalog/material mapping question he and David had yesterday, and he asks Barbara when this is handled – during product composition, part bundling or delivery? “I’m only responsible for sales processes,” is Barbara’s response. “But I know we receive a list in an Excel file whenever marketing makes changes to the catalog. However, we are only interested in the products and not mapping them to the parts; we sell products, not parts. As for production, you should ask Conrad. I think marketing is clearing this list with him before they pass it over to sales.”

Coincidentally, when Luke next looks at his computer for some related business processes, he finds that Conrad has sent an e-mail on that very topic:

“I support this decision. We are exchanging the mapping table with marketing via e-mail and publish it as a spreadsheet to the intranet. I have to manually update this information in the production planning application each time there is a change, which is really awkward. I don’t know who else might be doing something similar. Thank you, Conrad.”

Having read this, Luke and Barbara discuss it further, exploring the cross-divisional viewpoints. Although as a Business Analyst she is not responsible for service design, Barbara finds it easier to cross the “border” between business and IT. In fact, basic business processes are related to complex services, and she likes the transparent view the registry provides. This transparency enables a better understanding throughout the different operational units of BetterWidgets Inc., and so helps avoid process and implementation inconsistencies.

Key Topics	Business Benefits
<ul style="list-style-type: none">- Quickly adapt to changing business requirements using SOA Governance processes and tools- Engage key business people	<ul style="list-style-type: none">- Educates key business people, providing information and tools that easily incorporate SOA Governance into their work- Establishes additional channels of communication- Encourages key business people to become SOA Governance “evangelists”

2 SECOND MEETING OF THE SOA GOVERNANCE BOARD: ADJUSTMENT & EXTENSIONS

By the second meeting of the SOA Governance Board, BetterWidgets Inc.'s pilot project is progressing nicely. The SOA Governance Board members have elevated the scenarios to a rather mature process and new services and some application adjustments are currently under development with a first integration test as the next target. Chris has successfully convinced Barbara (the Business Analyst) to join the SOA Governance Board, a task made easier by her positive experience so far with the new SOA approach.

Chris' objectives now look farther ahead to:

1. Continue to integrate the business side more closely with SOA Governance.
2. Implement value assessment indicators and measures to support SOA.
3. Prepare to expose service interfaces to external consumers.
4. Revisit the Information Model and overall policies of the CentraSite Registry.

This SOA Governance Board meeting also identified critical tasks for the next phases, which will be covered in the following sections.

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Extend board to include additional key people - Set next targets - Tune SOA Governance - Expand use of SOA Governance 	<ul style="list-style-type: none"> - Identifies organizational goals and plans for the next level of SOA Governance - Defines and establishes SOA Value Metrics - Adjusts SOA Governance processes to better meet organizational needs - Expands support and use of SOA Governance

2.1 Measuring process change durations

Chris	CIO	Prepares SOA Value Assessment
Sam	Chief SOA Architect	Extends monitoring and reporting, especially process change durations
Luke	SOA Librarian	Creates queries and reporting procedures

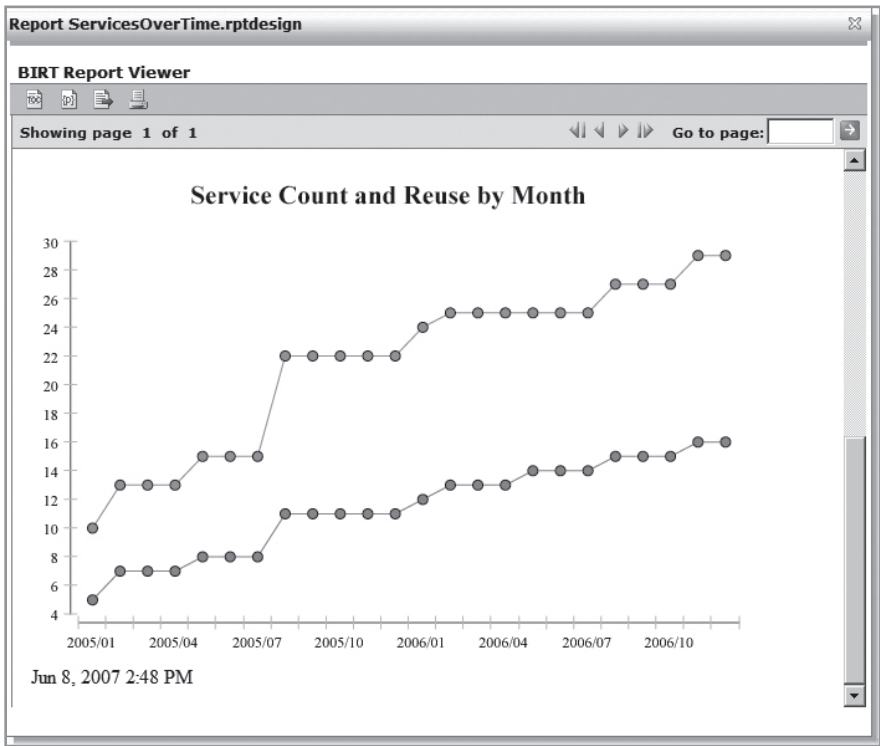
Chris is preparing an SOA value assessment⁴ to obtain more strategic support from his upper management. So far their SOA initiative has support from mostly IT and some business analysts, but it will need to evolve as an overall company "lifestyle" in order to succeed and realize the enterprise-wide benefits. In his recent conversation with one of the vice presidents, she recommended Chris create such a value assessment to increase interest and show the tangible benefits for the organization.

The SOA Governance Board is evaluating several measurements to determine the "value" of a their SOA. Obviously this cannot be expressed by simply counting services, artifacts or computational power. Luke has proposed some statistics on service and process reuse. This is certainly a good idea, but they need more specific indicators of improved transparency and agility. Barbara has an idea: "What impresses me most is the considerable acceleration of the overall process change procedure. Couldn't we measure change duration?"

⁴ see www.soavalueassessment.com/ for details on the SOA Value Assessment

Sam likes this idea. "Yes, we can. We have all the necessary data in the registry. Each entry has an attached timestamp, so we could figure out the earliest and the latest event related to a process change." However, in addition Chris needs a report which reflects that a certain percentage of all process changes have been implemented in a certain period of time. Luke proposes that they implement this as an extension of the lifecycle management system⁵ and sophisticated reporting capabilities that come integrated with CentraSite. He knows he can define a custom report using the Eclipse-based Business Intelligence and Reporting Tools (BIRT) to query the registry data and provide a graphical and textual report with the desired results. The report can be made available in the CentraSite Control Web interface so Chris could run it on demand.

Now they still need to see how they can measure service reuse, so Luke shows them one of the standard reports available on Business Metrics, which relates new vs. reused services over time. (SCREEN 8)



SCREEN 8 Report on Service Reuse

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Assess SOA's value - Measure and evaluate SOA progress 	<ul style="list-style-type: none"> - Clearly assesses SOA's value for the organization; provides metrics to increase upper management visibility and support - Analyzes and optimizes SOA for reuse, improved transparency and agility

⁵ See the online documentation "Lifecycle Management with CentraSite" for further details. http://documentation.softwareag.com/crossvision/inm/lmsref/lms_over.htm

2.2 Services with external consumers

Barbara	Business Analyst	Responsible for the business aspects of the external collaboration
Sam	Chief SOA Architect	Devises concept for handling policies
Luke	SOA Librarian	Manages policies in the registry, including their assignment to particular services
Martin	Operations Manager	Puts policy changes into production, monitors execution

BetterWidgets Inc.'s initial plans for SOA were cautious. Executives were very clear that the first phase scope was limited to internal integration and did not include collaboration with external sources. Service access was restricted to internal consumers with some thin Web applications on top for their external partners. But it did not take long for IT executives to notice that their partners were introducing similar efforts in parallel, and realize that the overall integration could be greatly simplified. By spreading the roles of service consumers and service providers across company boundaries, they could directly offer services to selected external consumers.

In the SOA Governance Board meeting, they discuss the fundamental differences between company-internal and cross-company service usage, related to security and trust, control and interoperability.

They note that with regard to security, internal service consumers and service providers normally communicate within the same security context. Both parties can rely on the same users and roles, can easily propagate identity credentials and will not maliciously try to enhance their own access. However, when company boundaries are crossed, especially when communication occurs over the Internet and not a dedicated communication channel, services are opened up to a whole new set of risks and challenges.

Another challenge they will need to face in communications between parties in different companies is that there is usually no single entity that controls and enforces decisions, leading to an increased need for tolerance, e.g., in compatibility and versioning. And most data exchanged between service consumers and service providers will flow through networks controlled by neither party, introducing high latency and less reliability.

Finally, their communications across ownership boundaries will require increased interoperability, as any assumptions concerning the platforms and environments used by the other party will be practically useless.

However, they conclude that while these aspects, among many others they did have time to discuss, clearly differ for internal and external interactions, the services provided and consumed are still logically the same – the same business logic but a different policy.

As a starting point for an external service consumer implementation, Barbara has been assigned the task of enabling InDirSales, their external business partner who handles BetterWidgets Inc.'s indirect sales, to access some of the warehousing services directly. This would reduce the time required for InDirSales to find out whether a given product is in stock. Barbara remembers the CapacityInfo service and asks Luke (the SOA Librarian) if the external company can access this service in a similar way. To help him decide what the appropriate policy might be, she uploads a Microsoft Word document to the CentraSite Repository, which describes the high-level agreement between BetterWidgets Inc. and InDirSales, which states the guaranteed response times, encryption and signature requirements and availability restrictions.

Sam (the SOA Architect), Martin (the Operations Manager) and Luke had previously devised a concept of how to deal with policies. The registry already contained a number of policies, each combining a set of decisions and guarantees ("assertions") in a logical way. Luke finds a policy that closely matches the requirements, and configures the CapacityInfo service to be accessible for external consumers under the rules of this particular policy. To enable requirements tracing, he links the Microsoft Word document provided by Barbara to the technical policy implementation.

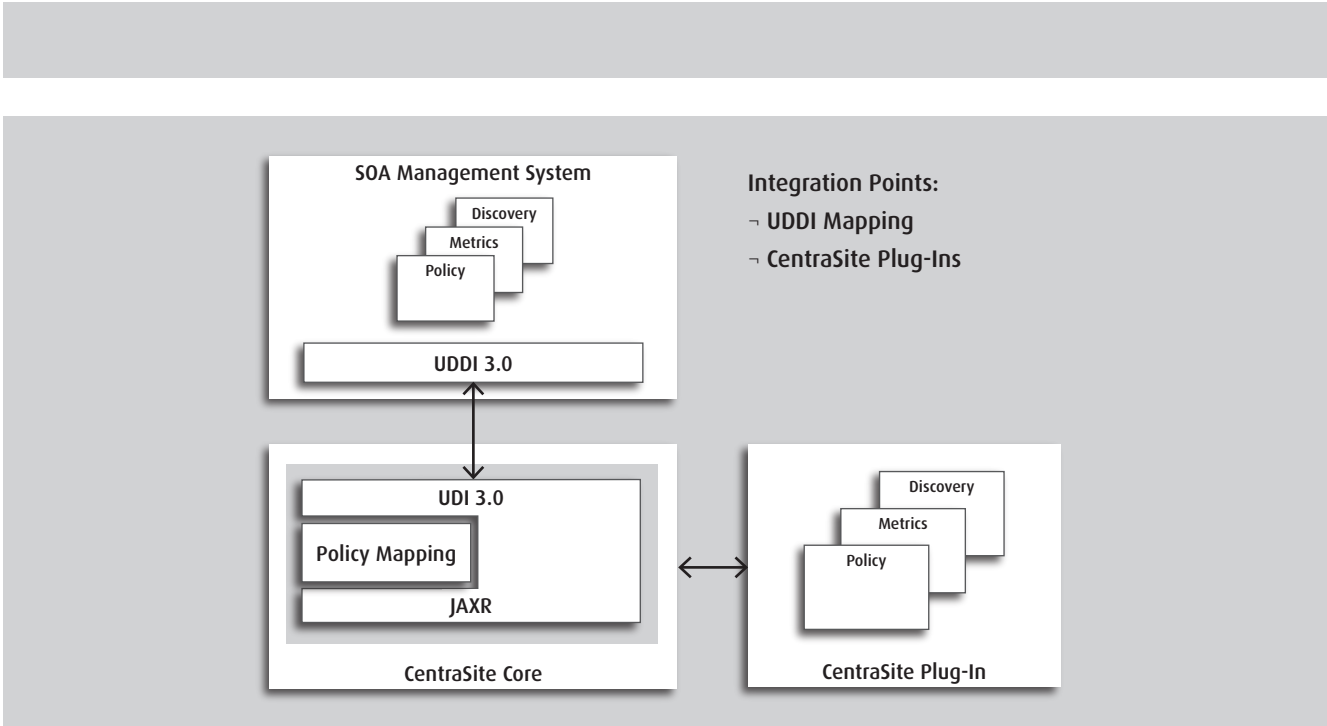


Figure 2 Integration points between CentraSite and an SOA Management System

While the steps they have taken so far ensure that the implementation matches their requirements, it is Martin's role to ensure these policy changes go properly into production. Luckily most of this work is handled for him by a combination of CentraSite and an external runtime management tool that can interoperate via CentraSite's out-of-the-box support for the UDDI 3.0 standard (see Figure 2). Based on this UDDI integration, in the future they could also develop a CentraSite plug-in for any additional integration needs.

The runtime management platform retrieves the new policy through the UDDI API and loads it into its information store for policy decisions (Policy Decision Point, PDP). At runtime, distributed policy enforcement points (PEPs) ensure that the policy is actually applied, i.e. that communication occurs only encrypted over a specific set of protocols. It also monitors runtime information, such as *actual vs. required* response times, the number of service invocations, throughput and many more aspects.

The information collected by the runtime management platform is filtered and aggregated appropriately, and sent back to CentraSite via the UDDI standard API. Later Barbara will be able to check on the policy compliance in production with a report showing the service's policy-compliant usage by InDirSales.

Key Topics	Business Benefits
- Extend use of services	- Extends SOA business benefits in a controlled way, minimizing risks using, for example, integrated runtime governance and security

2.3 SOA Architect revisits the Information Model

Sam	Chief SOA Architect	Designs the logical SOA model, defines integration requirements
Luke	SOA Librarian	Maps logical model into registry, develops/helps with developing CentraSite integration solutions

In the first phase of SOA Governance, BetterWidgets Inc. used the simple but powerful Registry Information Model provided by CentraSite. Now Sam, the Chief SOA Architect, needs to extend the model to meet their changing business needs.

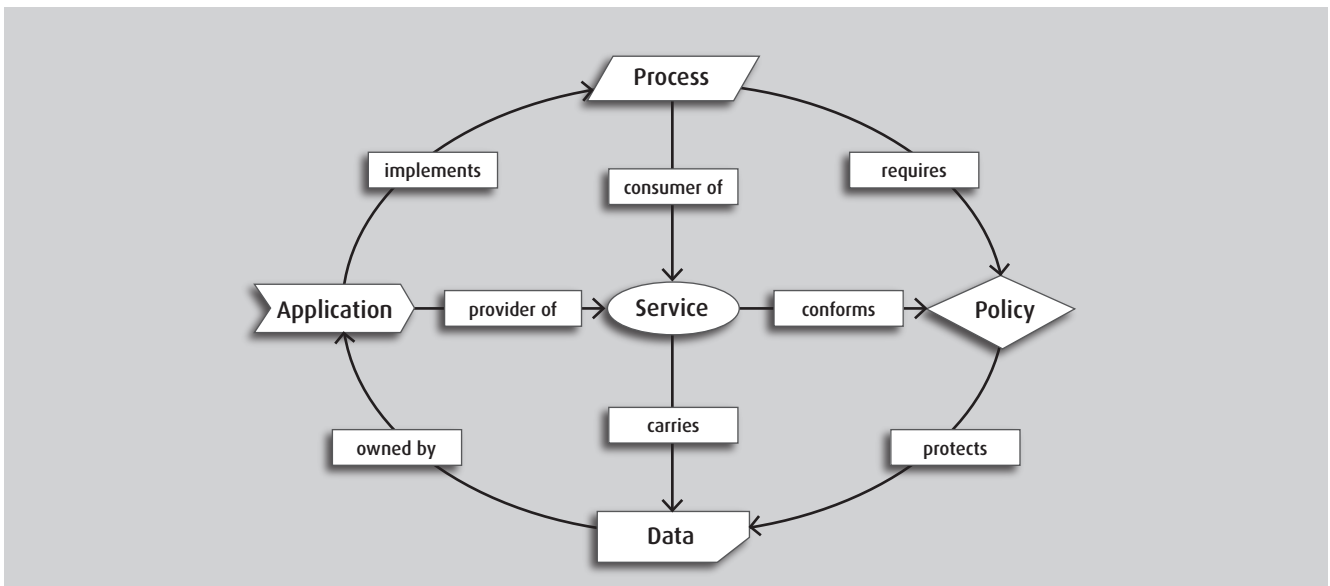
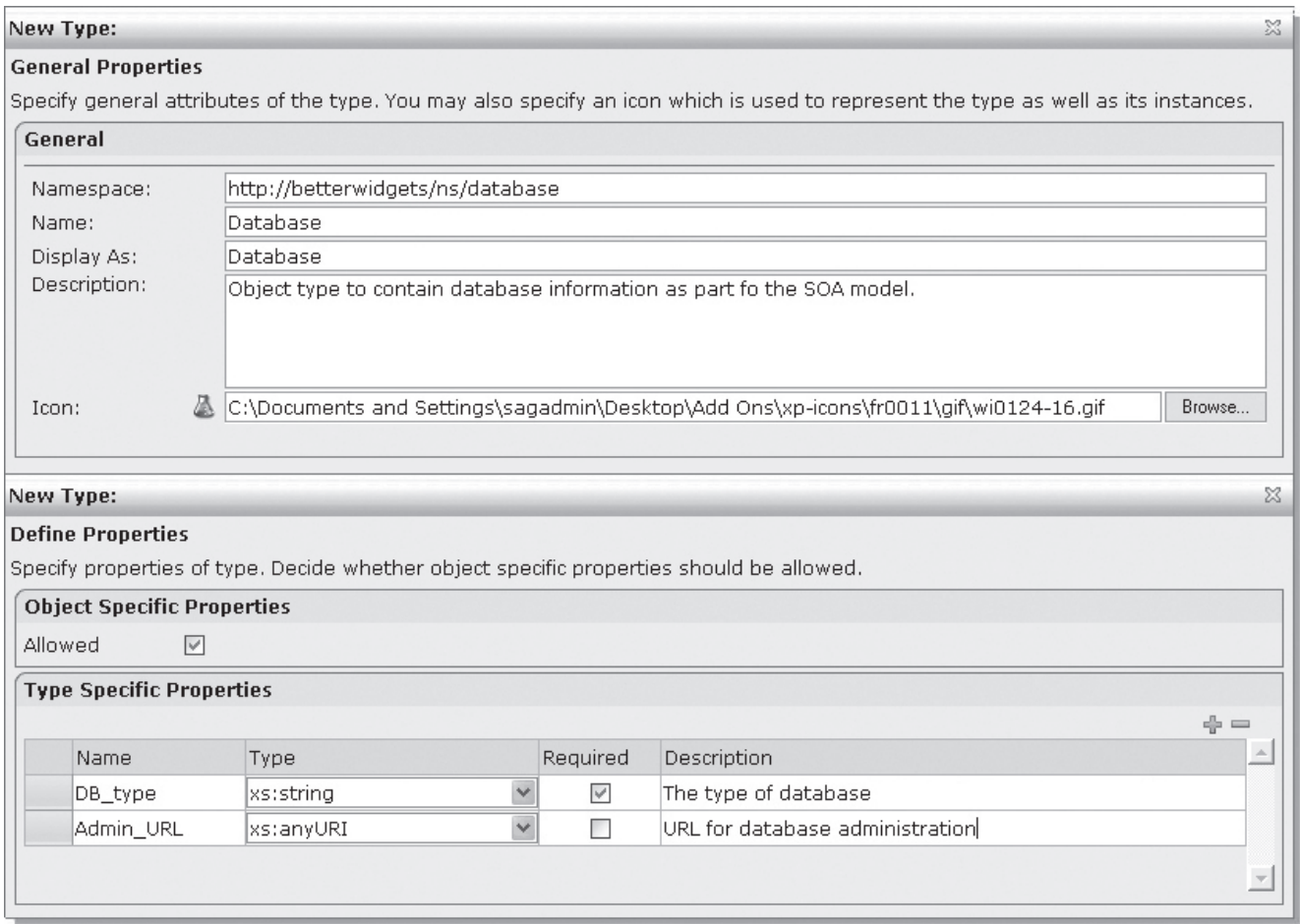


Figure 3 BetterWidgets Inc. draft Registry Information Model

To his draft (Figure 3), Sam adds a “Person” entity that relates to a service in multiple ways, signifying the technical and administrative owners. He also decides to assign services to “Domains,” allowing for clustering of functionality. Following a request from Martin, the operations manager, he also adds a “Database” entity to link between the logical architecture and the physical runtime environment more closely.

As the most knowledgeable person about the registry, it is Luke’s task to extend the CentraSite data model according to Sam’s design. He defines each entity with its attributes (SCREEN 9) and its associations to related artifacts (e.g., machine-readable descriptions, policies, graphical diagrams and plain documents). He also defines the rules and policies that manage and control these artifacts throughout their lifecycles. In this way, they have customized the Information Model based on their unique SOA evolution.



SCREEN 9 Extending the Information Model with a database type

Sam and Luke also collaborate to further integrate the CentraSite Registry solution into the company’s development processes. Both know from personal experience that the task of documenting software development models can be tedious, especially if it has to be done more than once (e.g., in different formats for different tools). They decide to launch a small project that will connect BetterWidgets’ CASE tool of choice, a sophisticated UML 2.0-based modeling tool, to CentraSite so that service and process models designed via UML component/package/class diagrams and activities can be loaded into CentraSite without manual intervention.

Key Topics	Business Benefits
→ Adjust Information Model	→ Adjusts implementation to better meet business needs

2.4 Extending the governance processes

Sam	Chief SOA Architect	Decides about policy changes
Martin	Operations Manager	Integrates third-party tools

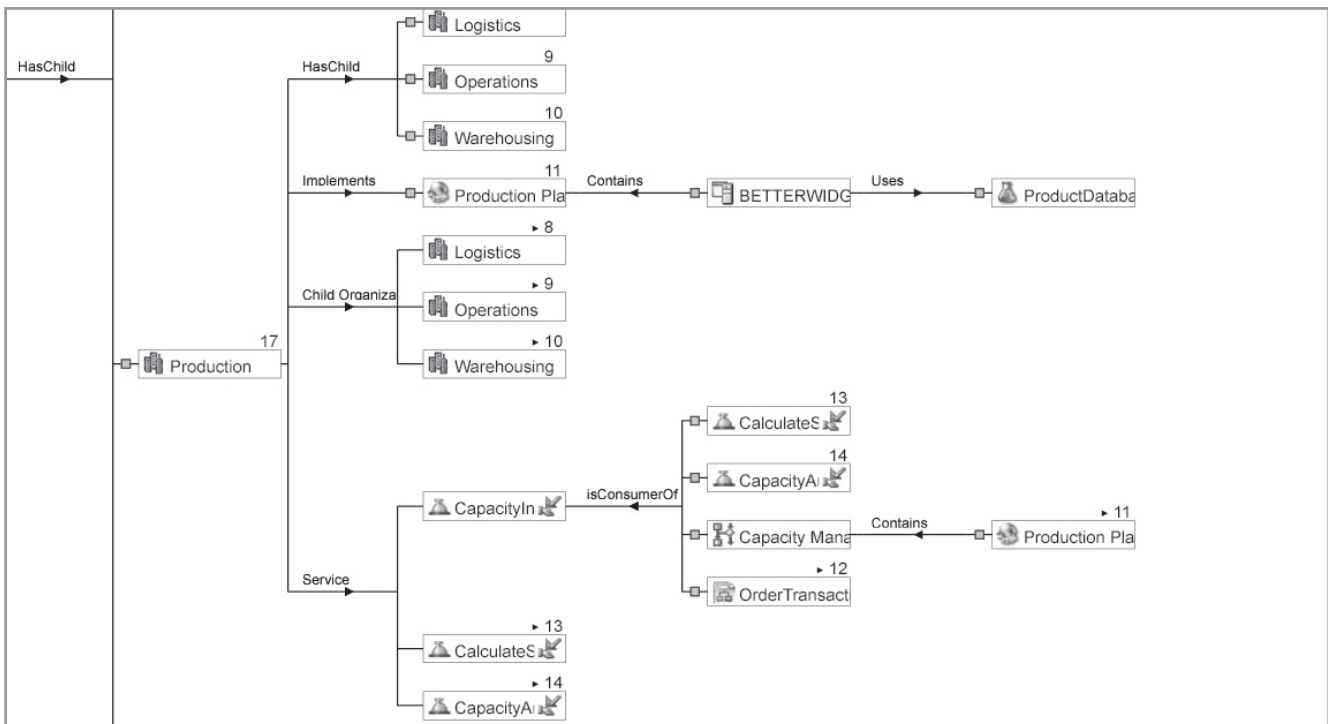
The integration of external service consumers has raised interoperability questions due to the extended heterogeneity of technical platforms and corporate practices. One measure to achieve a “seamless” integration is to ensure that only services described by WSDL descriptions which conform to the WS-I Basic Profile 1.2⁶ are allowed.

Sam and Martin decide to integrate some of the “testing tools” from WS-I.org that check Web services artifacts for compliance to the Basic Profile. The two of them develop a simple CentraSite plug-in that invokes the test whenever a new WSDL service description is submitted to the registry, reports any errors and warnings, and flags the service as requiring attention until the errors are fixed.

According to the company’s best practice, for every service there needs to be at least two WSDL files: one describing the abstract part (up to and including the portType), the other one describing the physical part (including ports and services).

Sam defines the security rules that apply to services, based on the service model. Services in the “human resources” domain require encrypted communication by default. The lifecycle for services in the general ledger domain may require sign-off by two parties due to SOX regulations. In this way, the governance solution is customized according to the existing corporate and departmental security rules and guidelines, and supports their control and enforcement.

Similarly, different rules may apply for services and the entities associated with them according to their operational state. It may also be useful to gather information during service operation, and use it to establish a feedback loop into the SOA Governance process – adding empirical information to enable analysis and tuning of the Information Model.



SCREEN 10 Integration of the operational model

⁶ www.ws-i.org/Profiles/BasicProfile-1.2.html

Sam and Martin establish links between services and the operational units that execute or use them, i.e. the applications, databases, application servers, or even hardware and network elements used to support them (SCREEN 10). The actual operational model can be simple or extremely complex, ranging from a simple attribute “deployed” to a complex graph of interrelated dependent operational objects.

Key Topics	Business Benefits
- Incorporate additional tools and processes	- Enhances and promotes effective SOA Governance

3 THIRD MEETING OF THE SOA GOVERNANCE BOARD: ALIGNMENT

Chris has just returned from a meeting of the board of directors where he has presented his concept of SOA business value. The message from the directors is that the SOA team is on the right track, having already achieved a considerable amount of clarity and efficiency. To assess the value provided to BetterWidgets by their SOA approach, Chris relied on an established methodology⁷ that focuses on five areas (Figure 4):

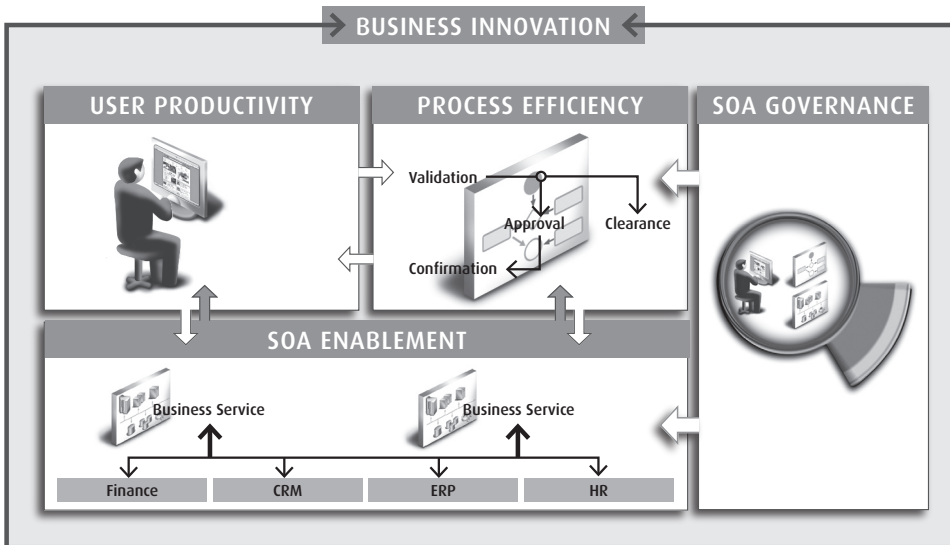


Figure 4 SOA Value Assessment

- User Productivity
- Process Efficiency
- SOA Infrastructure Enablement
- Business Innovation
- SOA Governance

Now the SOA Governance Board members sit together to consider what they have achieved in each of these areas so far and what should be on their agenda for the coming months.

⁷ www.soavalueassessment.com/

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Incorporate feedback from upper management - Monitor SOA Value and ROI - Evaluate progress, next steps - Identify next level of SOA Governance 	<ul style="list-style-type: none"> - Identifies achievements - Incorporates feedback from upper management, the SOA Governance Board and others to continue to tune for better alignment between business and IT - Further encourages innovation, collaboration and communication - Enables faster adjustments for new market requirements

3.1 User Productivity

The service-oriented redesign of the OrderTransaction process has helped solve customer requests more quickly and efficiently by integrating a catalog-aware handling of the CapacityInfo service.

Conrad, the Application Developer, is currently developing a composite application and an extension of the Cat2Mat service that will support collaborative product composition from manufacturing parts and replace the “spreadsheet solution.” This will allow for a fast and safe catalog update that will become immediately accessible from all organizational units, improving user productivity and overall efficiency. They know this will have significant impact on productivity across the company, but unfortunately no one had measured how many phone calls and e-mail exchanges were needed to get this information in the past, not to mention how many mistakes were made as a result in bundling and delivery, nor the related customer complaints resulting from conventional transmission errors and version mismatches.

For the external consumers, such as InDirSales, productivity has also increased as the users do not have to switch interfaces anymore between their own applications and the BetterWidgets Web client. This was made possible by granting external access to selected BetterWidgets services and securing them with effective policy management.

CentraSite supported the design of the OrderTransaction service in multiple ways across the entire service lifecycle. David, the Service Designer, was able to gain insight into the available services and their capabilities, and could publish information about his plans. Conrad, the Application Developer, was notified and so could react in time. The decisions David and Luke made met the company’s SOA Governance policies and guidelines.

Key Topics	Business Benefits
<ul style="list-style-type: none"> - Identify user productivity improvements - Highlight role application composition plays 	<ul style="list-style-type: none"> - Communicates what has “gone right” - Encourages propagation of good SOA designs - Identifies related areas for improvement

3.2 Process Efficiency

Process efficiency has been improved along with user productivity. Integrating catalog/part-relations handling throughout the processes and business units has resulted in fewer errors between cross-departmental processes.

Barbara affirms that they now have significantly increased controls over process implementation and policy enforcement, and she finds the process diagrams she creates have an immediate and positive effect on the way things work.

Chris emphasizes that processes need to be continually adjusted to meet new market requirements – exactly what he targets in his upcoming report to the directors on business process change durations.

CentraSite supports process efficiency both through the transparency it creates, enabling users to see the effects of changes, as well as through its metrics and reports that provide statistical information about changes.

Key Topics	Business Benefits
- Identify process efficiencies	- Communicates how processes have been better tuned and efficiencies achieved - Provides feedback for the positive impact SOA Governance has on the organization, for example in reducing errors and increasing control

3.3 SOA Infrastructure Enablement

Luke and Martin agree that a major improvement of operations management and service utilization has been enabled by CentraSite, and of particular importance was their ability to extend and customize the information model. They also emphasized the significant benefits achieved through dynamic binding of services to endpoints, increased transparency of policy enforcement and reuse instead of replication.

David notes that finding information about existing services, including detailed information about their data models, naturally led to the discovery of new service candidates. Martin highlights the integration of CentraSite with the runtime platform has improved operational excellence. Conrad is quick to point out that the integration with development tools has increased their developer productivity.

They conclude that the enablement of existing applications is aided by the CentraSite Registry capabilities to catalog information about existing and future service-related assets.

Key Topics	Business Benefits
- Identify infrastructure improvements	- Communicates how tuning SOA Governance using the right tools has resulted in infrastructure and process improvements

3.4 Business Innovation

The precedent of exposing BetterWidgets' services to business partners has opened them to new ideas applying SOA principles to other business scenarios, in order to realize new SOA business benefits. As a first wave, they would like to begin utilizing SOA with BetterWidgets' suppliers, proposing to provide detailed dynamic product information via services that will be integrated into the dealers' and distributors' web and online catalogs, and thereby improve their supply-side communications.

Thinking further ahead, Conrad mentions the idea of packaging and reselling select proprietary algorithms as services. He thinks that several of the dedicated algorithms developed in the production area might be of interest to other companies, and that they could sell use of the methods via service access without publishing and distributing the algorithms themselves.

CentraSite's strong policy support and integration with the SOA runtime platform enables BetterWidgets to not only consume services internally, but also extend service use to external parties without compromising their policy requirements – and realize new business opportunities.

Key Topics	Business Benefits
- Explore new business opportunities	- Uses SOA Governance to enables business innovation

3.5 SOA Governance

All members of the SOA Governance Board agree that having rules and guidelines, such as conforming to standards and emphasis on reuse, is a good thing, provided these are quickly adapted to changing needs and help people to perform their tasks instead of burdening them with formalities. Feedback from development teams, business users and operational staff suggests that this is what is actually happening in BetterWidgets Inc.

Luke points out that if services and the automated processes that rely on them are valuable company assets, they should be managed as such. David and Conrad agree that being able to find and assess existing services, evaluate changes to them and notify all involved parties early on avoids integration and redundancy problems. Sam and Martin stress the policy mechanism enabled them to adopt and enforce a cross-departmental SOA Governance process for all services of a particular category. Barbara remarks that the business side is very happy with the speed with which existing services can be exposed, to their partners as well, and as with the overall increased agility.

For Chris, it is clear that SOA is critically dependent on transparency, knowledge about existing and planned services, clearly defined design and development processes, the ability to separate functional and non-functional concerns and support for all aspects of the service lifecycle. He understands why SOA Governance is necessary to achieve the benefits promised by SOA such as reduced time-to-market, increased reuse, improved agility and quality, and cost reduction.

Based on their experience so far, Chris is convinced more than ever that his decision to adopt SOA Governance right from the start was key to BetterWidgets' success with SOA.

Key Topics	Business Benefits
- Reviews rules, guidelines, procedures, etc.	- Supports fine-tuning of SOA Governance to meet the organizational needs - Highlights the critical importance of using the right processes and tools from the beginning – to achieve a successful SOA adoption and greatly increased business benefits

4 SUMMARY

Like many companies, BetterWidgets concluded early on that SOA Governance is a critical aspect for a successful SOA effort. By relying on a sophisticated governance solution – the CentraSite Registry/Repository – many governance aspects were addressed not with complicated regulations, but by providing the users with a tool that helped them with their daily tasks in all aspects of architecture, process and service design, development and operations.

CentraSite helped to improve the documentation and transparency of the available business processes and services, as well as the underlying technical implementations. Support for sophisticated analysis of the impact of changes, taking into account even complicated interdependencies, increased their agility and minimized their risks. The integrated support for service lifecycle management, notifications and reporting capabilities improved quality and operational excellence.

CentraSite's strong Metadata Management capabilities together with its extensibility and adaptability allowed the IT staff to extend the Information Model, thereby providing support for the company's changing business needs. Its open architecture and flexible plug-in concept made it possible to easily integrate the registry with the BetterWidgets' environment, including having the choice of SOA runtime management platform and development tools.

For BetterWidgets, Inc., CentraSite delivered tangible benefits right from the start. Find out more information about CentraSite at www.softwareag.com/centrasite, download the community edition from www.centrasite.com or get in touch with Software AG to see how CentraSite can help your SOA efforts too.

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