XML-Empowered Documents Extend SOA's Connection to People and Process

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RESEARCH REPORT

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Executive Summary

SERVICES ORIENTED ARCHITECTURE (SOA) can dramatically improve the relationship between people, processes and information technology (IT). Yet the full value of SOA remains elusive for many end users due to disconnects between corporate data services and the document-centric types of information workers typically rely on.

SOA-driven data and information should reach workers in the document formats that they are accustomed to. And knowledge workers' valuable inputs and observations should enter into SOA-driven business processes through those same documents. In effect, workers involved in business processes should enjoy full and managed feedback with data services through a variety of documents.

Yet SOA implementations can be too rigid. Sure, SOA decouples logical tasks and data from specific applications, exposing business assets as standardized services for extended and repeated use. But if the goal for services is for them to be productively assembled, reused and revised to empower multiple business processes -- more ways are needed to share and gather more data that actually enable the processes. Dynamic, coordinated and two-way interactions are needed that bind services and real-world data to people in their element. People's activities and observations need to filter back to the IT systems and formats that support them. In short, the connection between people and SOA needs more help.

Fortunately, new advances in documents-based technology, management, and dynamic content enrichment offer a promising lifeline to help solve SOA's still-tenuous relationship to people and task-oriented knowledge delivery.

Document innovations help drive broader SOA adoption and value

These new document-enabling technologies and methods have a powerfully synergistic benefit to SOA. Dynamic documents provide a familiar yet managed interface for workflows and processes. At the same time, workers' inputs to typical document structures can reflect what data and knowledge the users encounter in their work, and quickly deliver that knowledge to back-end systems.

Extensible markup language (XML)-based structured authoring, compound document management, and XML metadata publishing are now providing workers with coordinated and dynamic content – in the formats, locations, and interfaces they favor. By providing broad yet governed multi-path access to the data locked away inside of documents, applications and databases, SOA becomes the prime means for more content types to extend across more processes and workflows.

This Interarbor Solutions research report explores how SOA can deliver more knowledge assets to the forefront of critical business processes by leveraging XML authoring and document management practices. It concludes, based on research sponsored by JustSystems, that organizations have another major reason to embrace XML-enabled documents: To elevate document-based assets and resources into SOA-supported activities, furthering a SOA's value by embracing more actionable data for more business purposes.

Combined, SOA and user-friendly dynamic documents can substantially improve productivity, refine processes, integrate people and processes, as well as accelerate the financial payback from investments in both advanced document publishing and SOA infrastructure and methods.

BROADER ENTERPRISE-WIDE SOA ADOPTION was widely expected by now. But so far, well into 2008, SOA adoption has predominantly appeared in pilot projects and for isolated integration activities.

SOA's fuller pay-offs come from a wider extension of previously application-specific data, allowing more data assets to better support more fast-changing business goals. However, the "crawl-walk-run" approach to SOA has limited how newly available content, data and knowledge fuels additional SOA productivity. It's clearly difficult to prime the pump of ever-greater SOA use and appreciation. The chicken-egg relationship between data availability and SOA adoption has, in effect, hobbled SOA's enterprise-wide emergence.

An entire class of valuable assets is ripening for services enablement and subsequent consumption by SOAs.

Smart organizations recognize that effectively moving to SOA first requires organizing and service-enabling their scattered and disjointed corporate data. Therefore, many enterprises are currently investing heavily in data integration, extraction, and cleansing for unification, as well as data warehousing for business intelligence (BI) and wider availability. Proper data services enablement begets wider SOA value.

More diverse content types enter the application service lifecycle

Yet structured data services availability alone can't bring about SOA's full benefits. The time has come to expand the grist available to the SOA mill, and XML-based structured authoring and document management assets offer additional rich, dynamic and manageable content for SOA implementations.

This trend supports the importance of better access for unstructured content and document-based information, now that the techniques exist to elevate such content for use within larger XML-based data and metadata services activities.

An entire class of valuable assets is ripening for services enablement and subsequent consumption and management by SOAs. Digital documents, enhanced by XML-based structured authoring, document management and XML meta data publishing, stand ready to serve as SOA-managed resources. Combining XML document management and SOA, therefore, heralds the advent of "documents-enabled SOA."

DOCUMENTS HAVE A LONG HISTORY as the preferred method for capturing and sharing information. Even today, from technical manuals for maintaining airliner hydraulic systems, to procedures for powering down nuclear power plants, to technical specifications for designing microprocessors – documents remain core to information, managed processes and knowledge.

While relational data is structured and empirical, documents are semantic, contextual and multimedia content-rich. Business agility occurs best when all of the data, content, knowledge, structure and policies are brought together in a relevant and consumable fashion. This is how fact meets context, and how process results can be accessed and amended by people – not just stored by ill-integrated machines.

Dynamic documents combine the best of modern IT architectures with the best of how users habitually consume and manage information. Documents possess other attributes: controlled formats, persistence and "live" updating via XML-based structured authoring and document management tools. These tools allow fresh data along with regulated structure and strict standardization of delivery and presentation to follow documents throughout their managed lifecycles.

In fact, documents now act more like modern software applications. Today's documents sustain near-constant change while preserving established workflows and formats. XML-linked dynamic documents combine the best attributes of both applications and static documents.

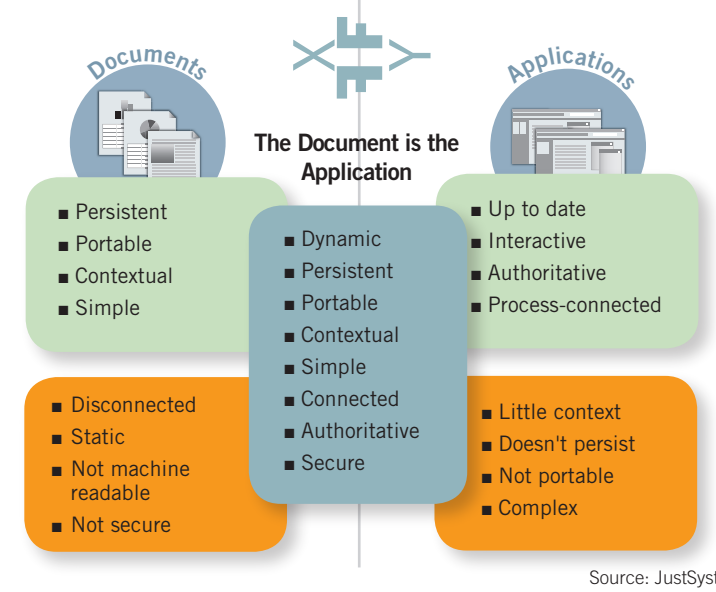

Diagram 1: Documents behave like applications

Dynamic publishing tools emerge

As mentioned earlier, a substantial gap persists between IT-supported activities and the accumulating knowledge of line-of-business and in-field workers.

Using such advanced XML-enabled tools as JustSystems XMetaL and xfy, content and data within structured and managed documents can be separated from the documents. Content from these documents has intrinsic business context, as well as a tight association with actual people embedded in the processes. And, as with SOA and data, content from documents can be used and reused, once separated and managed to the task and context of the activity.

Via standardized formats, fields and user interfaces, such creation tools as JustSystems XMetaL add dynamic content coordination to documents. Other management tools, like JustSystems xfy, provide a lifecycle framework for documents to become endpoints of composite application-like functions and reuse.

For sure, user-friendly formats and the time-tested document structures can provide the backbone for the new XML publishing and managed delivery benefits, combining the best of document attributes with the efficiency of IT- and SOA-supported content and application services (see diagram 1).

By closing the gap between people, systems and data, SOA and human activities can become more responsive to one another – more agile. Indeed, the more business context associated with newly

composited business services through accepted and time-tested interfaces like documents, the better.

Documents bridge people and Web-based processes

While developers and IT architects begin to focus on Web services, SOA and Web 2.0 mashups (known as Enterprise 2.0 development), a parallel set of initiatives around dynamic documents functionality has begun affecting the lifecycle of documents. Companies are increasingly looking to the Web for publicly available APIs and services to augment their SOA assets, while in a separate part of the business XML enables content to flow freely to documents. These activities should come together.

These external and internal mashup efforts can have a powerful impact when coordinated together. Many mashup tools, in fact, deliver Web data and content directly into document formats, including mainstream productivity applications like Microsoft Office. More work can be easily done to bring the "mashed up" data into many more kinds of documents, and even custom formats.

Thanks to "live" XML techniques, documents have become open to real-time data delivered via RSS and other loosely coupled delivery means. The content within the documents therefore gains a much greater purview. And for the promise of SOA to fully materialize, many aspects of business information must be made part and parcel of a SOA-driven process environment. That includes all the data from the structured and non-structured origins, from the Web and internal mashups, to be brought into play for the benefit of adjustable business processes.

Using XML-based tools, dynamic documents can now deliver and display managed structured data, which combines the best features of documents and active data services from virtually anywhere. And the access to that data can be readily controlled, and provisioned carefully.

In effect, dynamic documents publishing and management is providing the equivalent of wide-ranging APIs for accessing the knowledge and content hitherto fore locked up inside of applications and unproductively sequestered from documents.

Dynamic documents remain untapped by many companies

The management of processes around dynamic publishing methods is still young and not that well understood. Many different people within an enterprise have an impact on and role with documents. More work needs to be done to bring documents lifecycle management into play in many companies in a low-risk and easily understood fashion.

The good news is that many business processes already begin and end with standardized documents. The documents are there to be leveraged and better managed. Business workers within a workflow or who support a business process usually perform their tasks in association with proscribed procedures embedded within existing shared documents.

Rather than replacing access to structured data services, the approach of using documents to extend SOA enhances access to more information with less disruption. For a variety of vertical industries, documents are already advancing the use and role of XML technologies and benefits at the end-user level. As a result, XML can play an even larger role in loosely coupled services and data integration within a SOA.

Fortunately, XML and XML-based structured authoring already provides the core messaging technology of SOA-based applications. This presents an opportunity to explore the relationships between tactical XML use in content (refreshing and managing document content elements) and its more strategic use – XML as the lingua franca of loosely coupled services.

SECTION 3: XML Lowers Boundaries Between SOA, People and Documents

DOCUMENT-BASED WORKFLOWS and dynamic documents-based publishing have successfully linked people and processes. By design, SOA infrastructure strategically extends IT assets and resources via loosely coupled integration avenues.

Examining how these technical and productivity trends unfold leads to a logical and encouraging conclusion: SOA and XML content lifecycle along with XML-based structured authoring advances augment and reinforce one another. Because XML-based efficiencies are usually more mature and advanced than SOA, tactical XML-based structured authoring benefits need to migrate into a larger strategic SOA pattern.

These elements of IT – content, human knowledge, feedback, and coordination – can now come together in a governed fashion, and the whole will clearly yield benefits larger than the sum of the parts. XML lifecycle efficiencies can augment SOA on two levels – bringing fresh and managed information into individual documents, and applying those dynamic documents more appropriately into multiple business processes.

SOA, at the same time, can elevate and further empower the XML content lifecycle by offering a common framework for interoperability, governance, security, and the broader inclusion among composite applications or processes. SOA can also provide the means to extend knowledge beyond the department- or division-level and make fresh content pertinent to enterprise-wide and extended-enterprise activities. SOA can better deliver structured data and document-centric knowledge to where that information can be exploited best. And SOA can make those efficiencies easily repeatable and improvable.

The appropriate goal, then, is to include both data and documents in the SOA mix. The advantage of using rich, interactive XML documents is that content and data can empower the documents, as well as back-end applications and other aspects of SOA-supported processes. The documents and their data can accompany business services, and SOAs can access, aggregate, and repurpose those services.

Examples show valuable new roles for XML-powered documents

Use-case examples from such prominent financial sector players as commercial banks, investment banks, and insurance companies illustrate the rich possibilities of associating dynamic document lifecycle benefits with SOA strengths.

Native XML applications, XML-enabled documents, and the interoperability of XML Web services give forward-looking companies the tools to rapidly develop new business process efficiencies and benefits. There's a burgeoning opportunity for financial companies, among many others, to embrace dynamic documents and coordinate them with the growing use of SOA principles.

For example, structured XML-based authoring provides the basis for converting, reusing, localizing, and multi-channel publishing business-critical content. Line-of-business authors and business process participants can create XML-based documents that combine disparate distributed data and content into a single dynamic document. That end-point document can be updated based on continuously automated processes, content, and workflows.

Dynamic documents already provide accurate and timely data for such financial services organizations as insurance companies, commercial banks, and investment banks. Leaders in these efforts use XML-based dynamic documents to improve on how people and processes interact. Only a few, however, also take the added step of coordinating the document efforts through their SOA investments.

The opportunity for improvement is immense, because in many financial services organizations complex processes are strewn with "gaps" that require manual intervention among and between extended processes. These gaps, typically document-

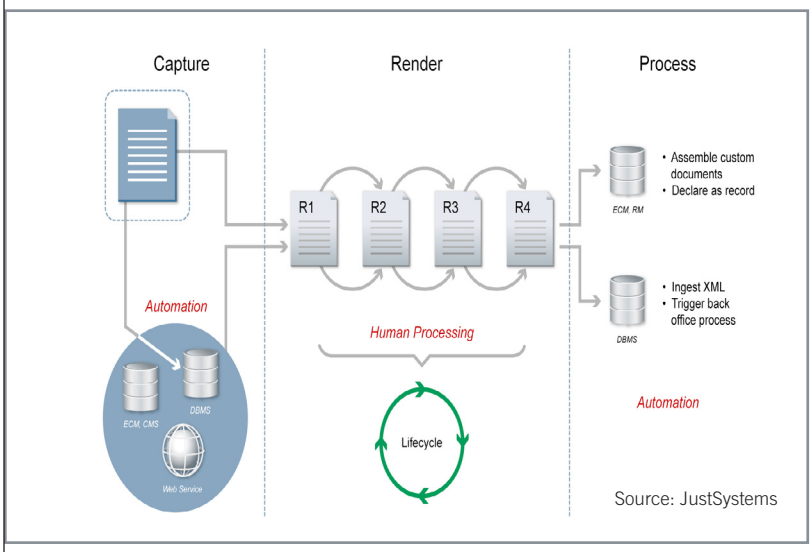

Diagram 2: Document Process Transformation

centric phases of a process, slow down work, insert risk into secure operations, and provide an opening for errors and missed steps.

Document process transformation using structured XML-based authoring and management improves the accuracy of data-rich documents, and accelerates cycle times while improving accuracy of collaborative projects and processes (see diagram 2).

Automatically integrating that transactional information with back-office systems can forge powerful feedback loops without manually re-keying or scanning the information. This allows for quick, automated updates to databases that also support larger business processes via the SOA. Such automation at the document level also slashes errors from human interactions.

As a result, those companies can streamline business processes and bridge gaps between automated transactional workflows and more human-centric document-based workflows. The trick is to automatically manage captured transactional information via SOAs and pull it via XML services into dynamic documents for human review and analysis.

Hybrid processes present special needs for reaching people

Underwriting and loan origination for banks is another area where process throughput can be accelerated and automated via dynamic documents, but without adding IT resources. Underwriting, a hybrid process, involves both automated transactional steps, as well as more human-centric steps, whereby stakeholders need to review and analyze documents. Bridging the gaps between automated and manual processing helps form seamless loan origination, which better supports wider business processes within an SOA.

In another example, insurance claims processing also requires hybrid processes, involving both automated transactional steps as well as human-centric steps.

The front end of the process uses standardized forms to capture information about claimants, and structured XML-based authoring and management passes some of that information to back-office systems for automated processing. It also allows for human review, which is rendered as a series of changing documents. With dynamic documents, this can involve only the information that is relevant to a role or a point in the process. So management of the data within a variety of documents is critical.

At the end of the process, the approved document can be declared as a record (complete with an audit trail), while some of the content is updated and integrated with a back-office system to serve other automated processes. Outputs can emerge under the SOA's policies and process models as custom document assembly for such tasks as acknowledgement letters, or for audit certification. Once again, dynamic documents combined with SOA automates and streamlines the entire process, from a form to a transaction, to a set of documents, back to a transaction again.

Consolidating dynamic documents with SOA-supported managed process activities accelerates the

cycle time for claims processing, improves customer service and reduces cost. The company also reduces errors arising from the manual steps, improves information privacy through dynamic document rendering, and sees reduced risk overall.

Complexity grows as groups of process stakeholders increase

Finally, even high-value, complex transactions – such as IPOs, mergers and acquisitions (M&As) and private equity placements – can be substantially improved when dynamic document management meets services-supported and integrated business processes.

For example, high-stakes business activities like M&As usually involve an intricate dance among distributed collaborative teams – bankers, lawyers, accountants, executives, and shareholders, as well as regulatory overseers, sometimes from multiple countries.

These groups typically share spreadsheets, e-mails, and document preparation and revision, which require an inordinate amount of time spent verifying, validating and reconciling information.

Dynamic documents managed by and associated with SOA-supported processes allow teams to focus on authoritative data and content, while eliminating the drudgery of validating and reconciling documents. Many of the documents could be stored and managed via cloud-based storage and collaboration systems, for easier sharing. Automation also allows tiered and managed distribution of results, such as documents containing only the specific information appropriate for stakeholders who receive them.

As shown from these use-case scenarios in the financial sector, XML-based structured authoring and document management tools and platforms enable organizations to accelerate the ROI of SOA initiatives by harvesting the value of the infrastructure already in place – and by encouraging lighter weight approaches to SOA-style application and process deployment.

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Summary and Conclusion

SUCCESSFUL SOA IMPLEMENTATIONS allow companies to access and extend more assets and resources locked up inside of enterprises. Combining the productivity enhancements of XML-based structured authoring and document management with the increasingly strategic benefits of SOAs is a next logical step. Embracing dynamic documents as SOA endpoints may also spur faster adoption of SOA principles and infrastructure.

Any knowledge or semantic asset that can be identified, tagged and contextually related to business functions should be made available to SOA composite applications as services.

If the accumulated business knowledge of individuals could better interface with services-enabled applications, organizations could combine the best of human experience with the new levels of IT interoperability. Any knowledge or semantic asset that can be identified, tagged, and contextually related to business functions should be made available to SOA composite applications as services.

JustSystems xfy provides a powerful document-based composite application framework that allows organizations to rapidly unify content and structured data as part of a single interactive XML document. Business users alone – without the need for a developer or programming – can leverage the xfy visual editor to compose applications. And those application-like documents can support SOA-enabled and SOA governance-managed business processes.

This combination – SOA and easily authored dynamic documents – empowers line-of-business teams to innovate around how information is accessed, combined and presented. It allows organizations to improve the speed and efficiency of manual and disconnected document-centric processes, and to dramatically improve technology and knowledge transfer across lifecycles and value chains.

As XML dynamically updates data and content across myriad traditional documents, user benefits transcend the former static formats. Users can update documents, while their structure allows many others to access current data. Elevating workplace knowledge and data via the familiarity of documents -- and then extending that information across multiple business processes -- that's what SOA is all about.

We are now entering a time when SOAs require better means to bring people, institutional knowledge and in-field data in sync with business processes. We can now cultivate documents that can dynamically evolve and self-update, allowing them to behave more like ad-hoc applications.

Combing these two aspects of modern enterprises -- SOA and dynamic documents -- can significantly improve the utility of both, while energizing processes and better binding knowledge to systems.

Companies with SOA projects should seek out documents as consumable resources – especially dynamic documents -- and then enlist them as resources for business-process benefit. Combined, SOA and user-friendly documents can substantially improve productivity, refine processes, integrate people and processes, as well as accelerate the financial payback from investments in both dynamic document publishing and SOA infrastructure.

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