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Use Existing Processes and Systems to Tackle Your Next Complex Business Problem

Harness the Power of SAP xApps Composite Applications

Consider any number of complex cross-organizational processes — from gathering all the data input needed for accurate manufacturing cost estimates; to creating an innovative, streamlined business process for HR succession planning; to aligning a new product portfolio with IT, Six Sigma, services, and other cross-organizational goals. Addressing these kinds of cross-functional business processes has long been difficult or expensive. But what if you could meet these business needs with the systems you already have, and without any backend customization?

Such process challenges can now be solved with ready-made solutions known as SAP xApps composite applications and “SAP xApps Certified” solutions from SAP partners. These solutions allow customers to leverage existing services in new ways within current business processes.

Leading this initiative for SAP is Dan Maloney, Vice President of the Global Ecosystem and Partner Group. In this article,¹ Maloney introduces SAP xApps composite applications and explains what they and “SAP xApps Certified” partner solutions — some of which are highlighted in this special feature — can offer your business.

For some, the concept of “composites” — and “SAP xApps composite applications” in particular — may be relatively new. But this is an area in which both SAP and its partners have been investing heavily for some time now, precisely because these solutions can address a range of business challenges — especially for those needs that require collaborative, cross-functional, or cross-organizational processes.

An Introduction to SAP xApps Composite Applications

Composite applications are highly dynamic, adaptable, services-based applications that automate business scenarios or user-specific processes spanning multiple functional areas. They are assembled by putting together reusable services from existing packaged and custom-built applications, and are built in line with SAP’s version of a service-oriented architecture (SOA), enterprise SOA.

Still, this hardly begins to address what’s so revolutionary — yet so elegant — about these solutions. One of the unique features of SAP xApps composite applications is that they are model-driven, independent of any backend data or

solutions. They are “assembled” rather than “coded,” so as a rule they are easy to adopt and configure. And they have their own life cycle — they are decoupled from their underlying systems’ maintenance life cycle, freeing your business from unwieldy upgrades or customizations in the future.

What’s more, these composite applications can target anything from highly specific tasks for a particular industry to something far broader. One SAP xApps composite

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¹ A version of this article originally appeared in the 2007 SAP NetWeaver Partner Solution Catalog (www.NetWeaverMagazine.com/catalog), which lists detailed information on “SAP xApps Certified” solutions available from partners.

SAP xApps composite applications can overcome business challenges that traditional business applications have trouble addressing.

application is built around Resource and Portfolio Management, designed for use by major construction companies managing huge, multibillion-dollar projects that involve thousands of people. Just because a composite application causes minimal disruption to your backend systems doesn't mean that it can't provide a wide range of powerful functionality.

Put SAP xApps Composite Applications into Practice

To understand where the features of a composite application provide advantage to businesses, let's look at a question many manufacturers face: Do we build standard products in a make-to-stock (MTS) approach or create make-to-order (MTO) products for more flexible capacity? Or, do we take a hybrid approach that factors in production costs, obsolescence costs, or salvage value?

Consider the automotive industry, in which a customer may have very specific requests: a premium sound system, a navigation package, and so on. The manufacturer can make the car to order and deliver it to the dealership. For the manufacturer, this MTO approach gives customers the

exact product they desire, eliminates costs associated with inventory and cars sitting on dealership lots, and often brings a higher premium.

Auto production, however, still often remains focused on traditional MTS orders, with customers purchasing cars directly off the lot. Auto manufacturers are looking for ways to switch from MTS to MTO without incurring higher production costs or frustrating customers with long wait times.

With SAP xApps composite applications, companies can rev up the same systems they use for MTS and transform them to MTO – and vice versa. By converting the necessary services into innovative business processes, an SAP xApp could help identify the lowest-cost, highest-quality material within and beyond the manufacturer's walls to fulfill a special order. It could evaluate optimal manufacturing and delivery options – whether insourced or outsourced – to reduce lead times to weeks or days and to ensure the right product makes it to the right customer at the right time.

SAP xApps composite applications can overcome business challenges that traditional business applications have trouble addressing. Business processes that involve highly collaborative aspects, interact across several functional areas, or rely on information available within and outside the enterprise are ideal candidates to address with SAP xApps composite applications or “SAP xApps Certified” solutions.

The Foundations of an “SAP xApps Certified” Solution

To be “SAP xApps Certified,” a solution must rely on three key elements:

- The first is *architecture*, which refers to enterprise SOA, SAP's version of an enterprise-scalable, service-oriented architecture. Enterprise SOA is all about productized services being easily consumed in a standards-based manner in the context of a business process. This allows an enterprise to leverage its diverse capabilities for co-innovation.
- Next is the SAP NetWeaver *platform*, which provides the fundamental building blocks necessary to deliver an SAP xApps composite application on a sound foundation. For example, SAP xApps composite applications tend to be user-interface-centric, so you can take advantage of the portal capabilities of SAP NetWeaver and multichannel access functionality to ensure that the solution can be easily consumed by your multifaceted user base.
- The last piece is a set of *composition* tools. The new SAP NetWeaver Composition Environment is standards based and offers developers and business process experts a visual, easy-to-use tool to build and run complete composite applications. It builds on the SAP Composite Application Framework tool for service composition, the Web Dynpro development environment for creating guided procedures for composite processes, and the SAP NetWeaver Visual Composer tool for building and adapting the views used by business process experts.

What You Can Expect from an “SAP xApps Certified” Partner Solution

When you see the “SAP xApps Certified” logo, you'll know you're receiving a solution that is of high value and quality, is nondisruptive to deploy in your IT environment, and is built in a future-proof manner that reflects SAP's version of enterprise SOA (see sidebar).

An “SAP xApps Certified” solution leverages the SAP NetWeaver platform and has been fully tested by SAP's certification organization, the Integration and Certification Center, to verify its technical integration with the applicable SAP solution.

For more on SAP xApps composite applications, visit www.sap.com/solutions/xapps/index.epx. You can find a directory of “SAP xApps Certified” solutions at www.sap.com/partners/directories.

Partners looking to develop and certify a composite application can contact SAP at www.sap.com/pbnw or directly at the Integration and Certification Center. ■



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SAP Composite Applications

Facilitating True Organizational Transformation

Aligning business and IT. This strategic objective has been at the top of many organizations' priority lists for years. But many companies still struggle to promote true organizational agility. The main obstacle? They don't know how to reconcile high-level business strategies with the historically inflexible nature of IT infrastructures.

Management and technology consultant BearingPoint, Inc. uses SAP NetWeaver to facilitate the move to a flexible IT infrastructure for clients around the globe. When implemented as part of an enterprise service-oriented architecture (enterprise SOA), the SAP Composite Application Framework (CAF) toolset can protect companies' investments in SAP technologies. At the same time, organizations can take advantage of the latest enterprise SOA-based composite application solutions, including SAP xApps composite applications.

Steps Toward Enterprise SOA

Tapping in to the full power of SAP NetWeaver and enterprise SOA requires more than just technical prowess – and it won't happen overnight. The road to SOA is gradual and requires some substantive organizational changes. To facilitate this transformation, SAP Global Services Partner BearingPoint has developed a multistep enterprise SOA implementation methodology:

1. Reorganize your traditional SAP shop using extended composite application capabilities. Extending your capability to harness composite applications and SOA is an evolutionary, not revolutionary, process. You'll still have to build point-to-point interfaces, make data conversions, and perform other mainstream SAP system tasks as you proceed toward your goal. You'll want to fortify your SAP solution-based environment using new skills and new viewpoints on doing business. To accomplish this, you'll need the aggregated expertise of all your SAP professionals.

2. Put strict change management procedures in place. Upgrading to next-generation enterprise SOA and SAP

composite applications means that users' roles and responsibilities will change. To help everyone accept those changes, we recommend first appointing an "enterprise SOA czar" to be the change catalyst, then creating a detailed training roadmap for all employees.

3. Establish comprehensive governance controls. The SAP NetWeaver platform makes it easier to build composite applications, but you could end up with innumerable organizational and technical "moving parts" that can make compliance with change control procedures challenging. We suggest setting up technical and organizational safeguards to manage the data and the process chain of command.

4. Bring together the right skills. Alongside your technical people, you're going to need orchestrators – people who understand and can clearly demonstrate the IT processes for fulfilling your business needs. Then, you will need business process experts who understand how system changes will affect your business. These roles must work in concert for a composite application implementation to succeed.

5. Reduce operational impacts. Finally, there's the question of how you do all this without a negative impact on your daily operations – both within IT and in your lines of business. By carefully managing how you update and modify existing systems while implementing new ones, you can reduce disruptions to your core business. Composite applications, including SAP xApps, allow you to extend functionality without affecting existing business applications.

Enterprise SOA: The Medium to Align Business and IT

Enterprise SOA is a journey, not an end state. With SAP NetWeaver, SAP has provided you with robust functionality to aid you on this journey. SAP composite applications, especially when implemented using BearingPoint's enterprise SOA methodology, make true business-IT alignment possible. Your enterprise will be able to rapidly change direction, unencumbered by your IT infrastructure. For more information, please visit www.bearingpoint.com/sap. ■

This BearingPoint enterprise SOA implementation methodology is derived from our experience deploying composite applications at client sites worldwide.



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iBASET

Calling All Complex Discrete Manufacturers

Expedite Your Response to Shop-Floor Exceptions

Enterprises that manufacture complex devices with long cycle times and deep bills of material must be ready for issues to occur on the shop floor. Some production orders will inevitably be held up, compromising schedules and jeopardizing on-time deliveries. Production control personnel must be able to respond efficiently to unexpected events, such as parts shortage caused by supplier delays or quality issues.

Manage Production Exceptions from One Screen

iBASET's new Solumina Production Control Packaged Composite Application (PCA) targets industries that specialize in manufacturing complex devices – industries like aerospace, defense, electronics, and medical devices.

What's innovative about Solumina Production Control PCA is that it manages actions in real time across both SAP solutions and the Solumina Manufacturing Execution System (MES), consolidating this information onto a single screen (see **Figure 1**). This eliminates the need for users to switch between screens or from one application to another to accomplish tasks.

On the shop floor, production managers use Solumina MES to identify delayed or defective parts that are holding up production orders at specific work centers. The

Production Control PCA then displays these hold conditions to production control personnel who, in turn, must take action, either by expediting the shipment of parts or alternate parts, or by authorizing a workaround. The following questions can help production control personnel gauge the severity of the problem and determine the best course of action:

- Can we work around the issues that are holding up the work order?
- When can we realistically expect delivery?
- How has this vendor performed recently?
- Can we use an alternate part or an alternate vendor?
- Do we need to issue a new purchase requisition?

Production Control PCA consolidates the information and functions needed to help answer and respond to these questions, and then updates the shop-floor MES user immediately on what actions were taken.

Designed for Seamless Integration with Your SAP Environment

By following the principles and standards of SAP's composite architectural guidelines, Solumina Production Control PCS delivers on the promise of enterprise SOA. The Solumina Production Control PCA is an "SAP xApps Certified" – and Powered by SAP NetWeaver – solution that complements both SAP solutions and Solumina MES functions for shop-floor process planners, production managers, mechanics, and inspectors. Composite applications that are "SAP xApps Certified" reuse, integrate, and orchestrate functionalities from existing application assets in the context of an enterprise SOA, with only selective development of new functionality where needed to fill gaps. This flexibility enables quick and codeless changes.

For more information, please visit www.solumina.com/products/pc-pca.html. ■

FIGURE 1 ▼ Solumina Production Control PCA's Work Order tab displays real-time shop floor status for the production order; the Part Info tab displays information about material requisitions, inventory, and vendor history

The screenshot displays the 'Work Order' tab in the Solumina Production Control PCA. It features two main sections: 'Part Shortages' and 'Operations'.

Part Shortages Table:

Part No	Part Chg	Qty Short	Oper Sched E	Hold Notes	Stop Type	Asgnd Work I	Build Part No	Build Part Chg	Oper No	Oper Key	Order No	Asgnd Work I
ASM000341	N/A	1.00	null	null	OPER STOP	MAINE	ASM0003-1	N/A	010	65	ASM1001	D405
ASM000342	N/A	1.00	null	null	HOLD	MAINE	ASM0003-1	N/A	010	65	ASM1001	D405
ASM000343	N/A	1.00	null	null	OPER STOP	MAINE	ASM0003-1	N/A	020	66	ASM1001	D405
MM-1000	1	105.00	null	Need to find or	OPER STOP	MM01	100-510	1	0010	99	100002005	MM01
MM-1005	1	1.00	null	Changed This	OPER STOP	MM01	102-100	1	0010	110	100002001	null
MM-1006	1	1.00	null	null	OPER STOP	MM01	102-400	1	0010	123	100002004-B	null
MM-1007	1	1.00	null	null	OPER STOP	null	102-300	1	0010	119	100002003-B	null

Operations Table:

Oper No	Status	Title	Location	Department	Work Center	Sched End Date
0010	IN QUEUE	Adjust housings	MM01	null	null	null
0020	PENDING	Bore openings	MM01	MM01	null	null
0030	PENDING	Gasket use	MM01	MM01	null	null
0040	PENDING	Test and Acceptance	MM01	MM01	null	null



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Harness the Power of OSIsoft and Enterprise SOA to Fuel Operational Information Delivery

For any organization that is linked to a manufacturing environment, a direct connection to the plant floor is an essential element of becoming a more agile enterprise. Systems in today's plant environments were designed to accept only minor amounts of information from the ERP level, but future systems must address the broad scope of information available, transmit that information in both directions, and ensure that it is accurate, timely, and properly packaged. In other words, systems must expose an underlying event and prompt a resulting action.

Accordingly, in the utilities and manufacturing sector, a significant initiative to enable this agility involves redesigning processes through the creation of enterprise services, as well as employing these services in a packaged composite application, or SAP xApp, such as SAP xApp Manufacturing Integration and Intelligence (SAP xMII). This aggressive approach requires the reengineering of utilities and manufacturing industry processes, and cannot just rely on the simple "wrapping" of data coming from a plant and the transportation of that information to another system of record.

Of course, the concepts of Web services and SOA are not new; in fact, the past few years have seen a multitude of highly granular and low-level Web services being developed. What is new with enterprise SOA and enterprise services is the idea of *orchestrating* Web services, stringing together "bite-sized" service chunks to produce an end result (see sidebar at right).

Make Operational Data Available in Real Time

To support process optimization in the utilities and manufacturing industries through enterprise services, OSIsoft delivers the **PI System**, a platform that gathers, archives, and processes operational data, then delivers it as meaningful information that can be viewed through application front ends. A new and innovative component of exposing this information is the **Facility Monitor**, an "SAP xApps Certified" packaged composite application that consists of

enterprise services residing in the SAP NetWeaver environment, as well as a suite of iViews that display aggregated event information within SAP NetWeaver Visual Composer.

Facility Monitor provides plant or asset information in the context of management dashboards, supplying sensor-based information that other services built with SAP NetWeaver Visual Composer can use. Because it was built within Visual Composer, Facility Monitor can obtain current and historical operating information using OSIsoft's enterprise services and then display this information in helpful UIs, such as the the portal capabilities of SAP NetWeaver

Delivering on the Enterprise SOA Vision

OSIsoft has long held that the most valuable, yet often unrecognized, asset a company has is its data. It is for this very reason that we developed our first real-time data platform over 25 years ago. Finding innovative ways to help customers store, retrieve, and make sense of their data has been our single motivation, driving us to evolve into the company we are today.

In support of that vision, OSIsoft and SAP are collaborating to develop and implement enterprise services by leveraging SAP NetWeaver and its enterprise service-oriented architecture (enterprise SOA). This collaboration is taking place within various industries and at multiple levels within the SAP ecosystem.

SAP's enterprise SOA is the platform that underpins business process reengineering. With enterprise SOA, required functions are encapsulated into incremental, well-defined enterprise services, promoting:

- Reuse of code
- Simplification of test and upgrade procedures
- Revenue-generation opportunities resulting from the agility that an enterprise SOA environment affords

OSIsoft believes enterprise SOA offers customers an effective way to leverage in-place investments, access and use their data to run their businesses, and promote innovation. Packaged composite applications such as SAP xApps drive the value of enterprise SOA.



FIGURE 1 ▲ The OSisoft PI System gathers operational data from across the enterprise and, through Facility Monitor, displays this information in common application front ends, like SAP NetWeaver's portal

OSisoft is proud to be an active participant in SAP's Enterprise Services Community, a collaborative forum in which SAP, its partners, and its customers work together to define business services.

(see **Figure 1**). With Facility Monitor, application designers can also use SAP NetWeaver Visual Composer to create packaged composite applications that can consume real-time data in the PI System and display that information in the portal.

Comprehensive Data Management from PI System

Along with the ability to display information in the context of dashboards and other interfaces, allowing management to make informed decisions, PI System can permanently archive high-resolution, real-time (often streaming) data. With a library of more than 500 native and standards-based interfaces to devices and other data sources, the PI System can satisfy any company's connectivity demands. To support rapid retrieval and visualization of that data, the PI System offers an advanced architecture that supports load balancing and disaster recovery.

Access to this kind of real-time data provides the means to accelerate the decision cycle by enabling a "management by exception" environment – the very environment that must trade in the currency of KPIs, dashboards, and similar applications. For example, an Energy Management program or application would need to embed the notion of an event – whether the event signifies a changing condition (condition-based) or provides operational insight into market or environmental conditions that might preclude or prescribe programmatic action.

These underlying data management capabilities, coupled with the power to expose information via enterprise services, deliver a low-risk way of ensuring that a utility can serve a

variety of information consumers via rapidly created and easily modifiable composite applications.

Further Benefits of Fusing OSisoft Technology with Enterprise SOA

To deliver on the enterprise SOA vision so that real-time enterprise services (not just data) and derived events can manifest in SAP's enterprise services repository,¹ an OSisoft enterprise service must expose analyses or notifications, as well as fundamental asset, event, and process data.

Customers have long trusted the PI System to safeguard their data and to provide real-time, enterprise-wide visibility into operational events. The PI System proves itself time and again as a platform for extending operational insights to all levels of an organization – helping customers successfully manage their assets, mitigate risks, and identify new market opportunities.

OSisoft believes that enterprise SOA allows customers to effectively access and use their data so they can better run their businesses and easily innovate – all while leveraging current technology investments and keeping TCO down. By exposing real-time information from the PI System via enterprise services, OSisoft ensures that its real-time data and supporting functionality are readily consumable and that they comply with SAP's vision of one business process platform. With this package, valuable manufacturing SAP xApps (such as SAP xMII) and composite applications will be able to orchestrate PI System's enterprise services into existing and new dynamic business scenarios that rely on aggregated or event-driven information.

Conclusion

By participating in SAP's Enterprise Services Community² and contributing to the SAP NetWeaver enterprise services repository, OSisoft protects customers' investments, delivering on our mission to help clients use the data they are collecting to accelerate decision making at all levels of an organization. For more information, please visit www.osisoft.com/sapinsider. ■

¹ For more on the SAP NetWeaver enterprise services repository, the central repository in SAP NetWeaver where enterprise services are stored, please visit www.sap.com/platform/ecosystem/escommunity/index.epx. Also, see the article by Mitchell Kick in *SAP Insider's* April-June 2007 "SAP Ecosystem in Action" special feature (www.SAPinsideronline.com).

² For more on SAP's Enterprise Services Community, please visit www.sap.com/platform/ecosystem/escommunity/index.epx. Richard Probst's article in *SAP Insider's* April-June 2007 "SAP Ecosystem in Action" special feature also covers this topic (www.SAPinsideronline.com).