

Salesforce.com to SAP Integration

Practices, Approaches and Technology

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This edition published Sep 2013

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If you're a Salesforce.com user, chances are you have a core enterprise system as well, including systems that maintain data of record. In many cases, this ERP system from SAP, which resides on premises. If this is the case, it's essential that you devise a strategy to integrate your SAP ERP system with the salesforce.com platform as early as possible in the implementation. This paper will review strategy guidelines that help ensure these two systems work and play well together.

The concept of integration has been around for a long time. However, integration is still a complex beast that requires the right approach and the right enabling technology. You have many technical issues to consider, including adapters and interfaces, communications, semantic mediation, format conversion, security, and the core approach you'll take. At the end of the day, there are even more options to achieve optimal integration. While all approaches can work, each carries its own set of risks, costs, and tradeoffs. The idea is to leverage the best approach for your particular integration requirements.

The value of integration is clear, specifically, the ability to sync information between several systems, and thus reduce redundant data updates, and the ability to access the value of remote data, as if it were native. For example, the ability to enter a customer only one time into salesforce.com, and have that customer appear automatically in SAP. Or, the ability to do a credit check from SAP, and have that information appear in salesforce.com as we manage customer relationships. In essence, you want to make these two very different systems function as if they were a single system (see Figure 1).

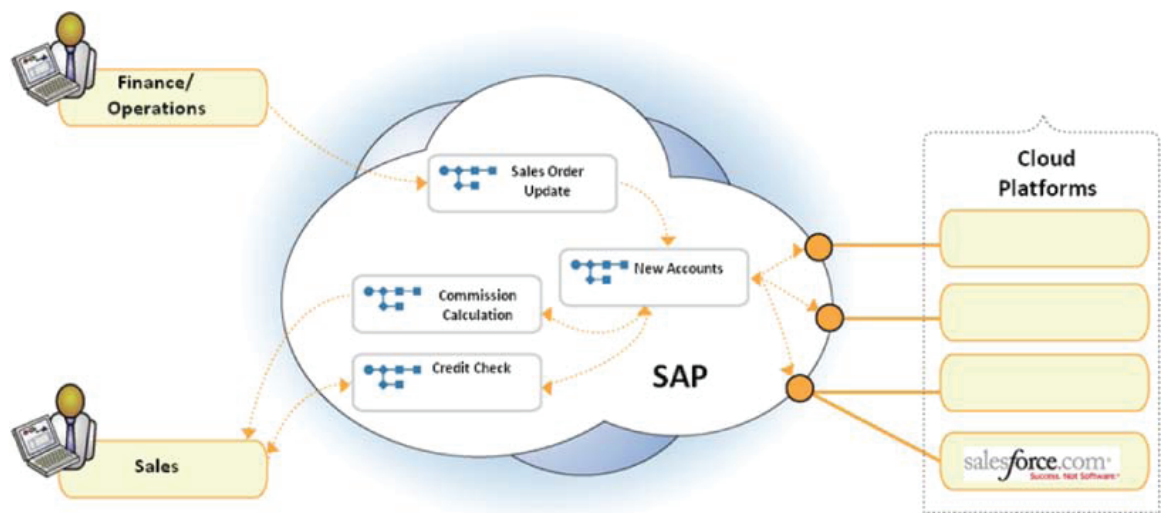


Figure 1: Integrating cloud-based applications, such as salesforce.com with SAP, delivers huge value to the end users since the systems can exchange information as if they were a single system.

In this paper we'll take the mystery out of salesforce.com to SAP integration. We'll outline the challenges; suggest how you can create an approach, and then how to select the right enabling technology to meet your requirements. Moreover, we'll suggest a process that you can leverage to insure that you get your salesforce.com to SAP integration project right the first time.

The Challenge

The core issue is not around SAP or salesforce.com itself, it's around the fact that salesforce.com is a SaaS-delivered application and thus in the cloud, while SAP is an on-premise application. This complicates the integration since you're doing a company-to-company integration project, and must deal with a few firewall and security issues.

Beyond the differences in the application delivery models is often the lack of experience in providing this type of integration. While integration has been around, as a concept, practice, and even sets of technologies, there are few repeatable approaches and technology for linking salesforce.com to enterprise-based SAP. Indeed, many enterprises approach the problem by dual data entry, which quickly leads to data quality issues and is not at all efficient.

As with any system-to-system integration effort, you first need to deal with the underlying requirements of data integration including:

- Connectivity
- Schemas and records
- Common transactions
- Transformation and mapping
- Data movement, including how to look at staging and direct approaches (see Figure 2)

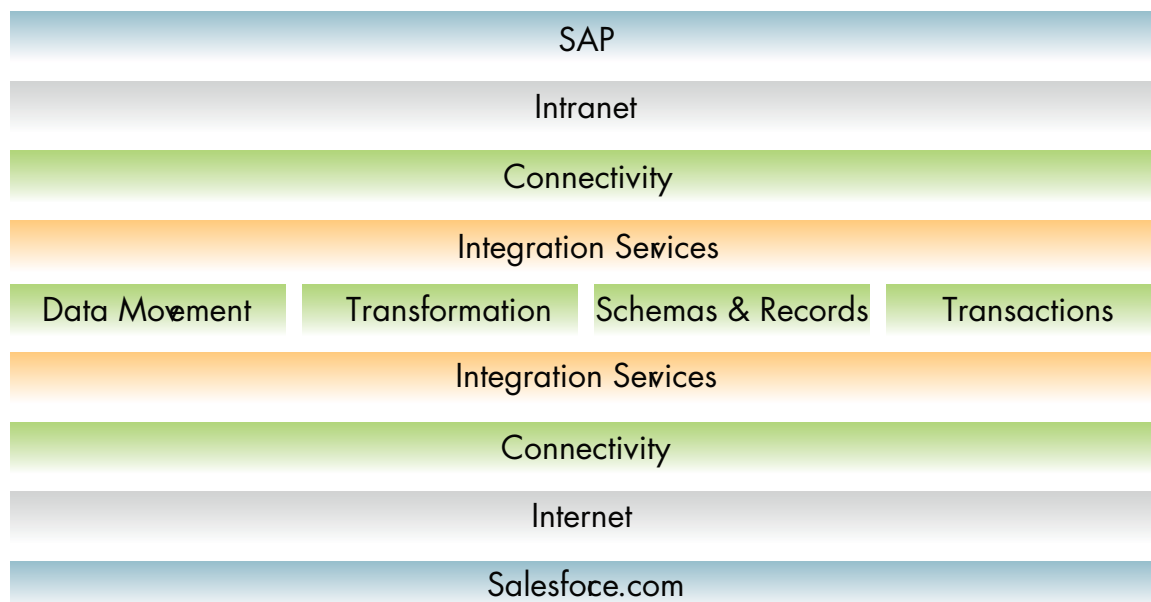


Figure 2: When integrating SAP to salesforce.com, you need to consider connectivity, data movement, transformation, schemas and records, and transactions.

Connectivity refers to the mechanisms and process of connecting to interfaces provided by both SAP and salesforce.com, both APIs that are maintained by the respective on-premise and on-demand software providers. Key to connectivity is the ability to maintain a durable and “self healing” connection that’s able to produce and consume data, managing the movement of data from the source to the target, and from the target to the source.

What's core to connectivity, when considering SAP and salesforce.com, is the abstraction of the connection from the integration mechanism. Or, better put, the ability to connect to the systems using a single common interface that does not require deep knowledge of the connectivity mechanism, or API, within SAP or salesforce.com. When approaching connectivity this way, you're able to update, upgrade, and replace the connection mechanisms without having to change any of the integration components, including transformation and mapping definitions, to account for the change in interface. In essence, this allows the data integration technology vendor to handle that for you.

Another identifying component of information existing within salesforce.com and SAP is data structure, or the design of both the **schema and records**. How information is structured, including the properties of the data elements that exist within that structure can be gleaned from knowledge of the data format. Likewise, length, data type (character or numeric), name of the data element, and type of information stored (binary, text, spatial, etc.) are additional characteristics of the data that may be determined by its format. Different structures and schemas within salesforce.com and SAP must be transformed as information is moved from one system to another.

The good news when it comes to understanding schemas and records is that they are welldefined within both SAP and salesforce.com. In other words, we understand the schema for the target and the schema for the source, and can account for the differences within the integration engine. The bad news is that we need to account for those differences, and we'll do so using our mapping and transformation mechanism described below.

Once the native data of salesforce.com and SAP is understood, and baseline information such as the metadata model has been created, the decision must be made regarding how to approach the enterprise business model, or, **common transactions** shared between SAP and salesforce.com. We need to understand transactions in the context of SAP to salesforce.com integration for a few core reasons, including the fact that it will determine when and how we synchronize data between the two systems around these transactions.

For the purposes of SAP to salesforce.com data integration we can consider a transaction as the movement of information around some type of business event, such as adding a customer or updating a sale. Thus, around these transactions we need to synchronize information between the two systems.

Core to that requirement is the need to support a SAP to salesforce.com data integration solution, a powerful **transformation and mapping** tool to explore application-level objects such as accounts, contacts, opportunities, leads, and customers in your salesforce.com org through a single, easy-to-use GUI. This is core to the SAP to salesforce.com integration solution considering that the ability to mediate the differences between the source and target schemas, and do so within the free flow of information between the systems, is the fundamental issue to solve here.

Transformation and mapping is necessary for a couple of reasons. First, data that exists in one system won't make sense to another system until the data schema and content are reformatted to make sense to the target system. Second, it will assure the maintenance of consistent application semantics from system to system. Once the above steps have revealed all the information available, it is time to map the data movement from system to system; what element or interface the data is moving from, and where that data will ultimately move to.

For example, the customer number from the sales data in salesforce.com needs to move to the credit reporting system within SAP. This knowledge would enable us to map the movement from the source systems – the sales system, to the credit system – the target system. The physical location of the information would be noted, along with what security may be present, what enabling technology exists (e.g., relational table), and how the information is extracted on one side to be placed on the other.

It is also necessary to note the event that is bound to the information movement. Or, if no event is required, what other condition causes the movement of information from the source to the target, such as time of day real-time, or when a state changes.

Data Movement Approaches and Tradeoffs

Considering the core mechanisms that are required to support SAP to salesforce.com integration as outlined above, there are two different approaches to data movement to consider: Direct and staging. Before embarking on this integration project, you need to consider the tradeoffs. The approaches and tradeoffs are covered in more detail in this white paper.

Direct integration is about moving data from one source and schema to another, and translating the differences in semantics from the source to the target system, in this case, SAP to salesforce.com. The idea is to extract the information found in the source system, such as customer information, and place it in the target system using whatever native schema the target system uses, and translate the differences in schema and content, as needed, recordby-record.

Direct integration is characterized by:

- Limitations in supporting complex data operations, generally doing very simple data operations such as transformation and routing. It's difficult to carry out these operations on each and every record, and still maintain data quality and efficiency.
- More fine-grained, meaning the data sets are usually small and repeat. While this is fine for small transactions, typically data moving from salesforce.com to SAP or back, it is significant and heavyweight.
- Operational focused, or when data needs to flow between systems to support ongoing light transactions. Larger data integration needs are typically ignored, including the ability to update, replicate and access strategic data storage, such as data warehouses for use with business intelligence applications.

In contrast to direct integration, a **staging approaching to integration** supports more complex and valuable data integration operations, including support for many large data sets and data operations that are more complex and of higher value. You can think of staging as the movement of large amounts of information, typically on a schedule, and dealing with data cleansing and data quality issues more holistically and effectively.

Using a staging area, or a temporary location where the data from the source system or systems is replicated, provides a logical location to perform complex operations on the data that would be difficult if not impossible to do when using direct integration approaches. In most cases, when considering the long-term value of the data integration solution, leveraging staging as an approach to data movement is much more efficient and effective than attempting to use more direct or event-driven approaches.

Leveraging a staging area for integration is characterized by:

- The ability to perform more complex operations on data, including complete transformation of semantics and the data content using any number of dimensions since, in essence, you operate on an intermediary database that you control completely.
- The ability to leverage more coarse-grained and complex data sets that may not always repeat.
- Informational focused, supporting valuable data externalization approaches, including business intelligence.

- More flexibility around business cycles, data processing cycles, widely disbursed systems, and hardware and network limitations, where it may not be feasible to extract all operational databases at the same time.
- The ability to better support complex database functions, including replication, cleansing, and aggregation.¹

Joining Salesforce.com to SAP

Many organizations that leverage SAP now use Salesforce.com as well. Thus, there is a core need to bring these systems together to meet the requirements of the business. Traditionally, integration has been highly technical, difficult and expensive to carry out, and thus often avoided to the detriment of the business.

The idea of integration is to provide the capabilities needed to exchange information between Salesforce.com and SAP, but to do so using an easy-to-use technology that's custom made for these integration requirements, including connectivity, transformation and mapping, and controlled data movement. This removes the SAP and Salesforce.com user from having to create a one-off solution to solve a problem that has already been solved.

Leveraging Informatica

Informatica is the independent market leader in data integration, so not surprisingly the company offers multiple possible approaches (cloud-based and on-premise) to help organizations integrate their salesforce.com and SAP systems. Professional Services and System Integrator partners also have expertise in implementing and customizing a solution. Let's break these down into some common integration use cases:

Accounts and Contacts Synchronization:

Synchronizing account and contact data from SAP to salesforce.com to ensure CRM system is up-to-date is the number one requirement for basic integration between these two systems.

- Informatica allows you to establish customer master data synchronization with a wizardbased interface designed for non-technical users. Integrate with mySAP applications is typically uses Application Link Enabling (ALE) to send and receive Intermediate Documents (IDocs), which are messages that exchange electronic data between SAP applications or between SAP applications and external programs for real-time, asynchronous communication.

Bi-Directional Account Creation and Maintenance:

Salesforce.com users need to be enabled to create and maintain accounts using the salesforce.com GUI only. SAP master data needs to stay in synch and certain controls and rules need to be obeyed and – if necessary – manually corrected or authorized before committed to the system.

- Informatica can deliver real-time and bi-directional synchronization.

Opportunity to Order Processing:

Enable sales reps and/or call center agents to process an opportunity (from initiating to order confirmation and execution in SAP) solely through the salesforce.com user interface.

- Informatica can deliver real-time, bi-directional and multi-threaded data synchronization.

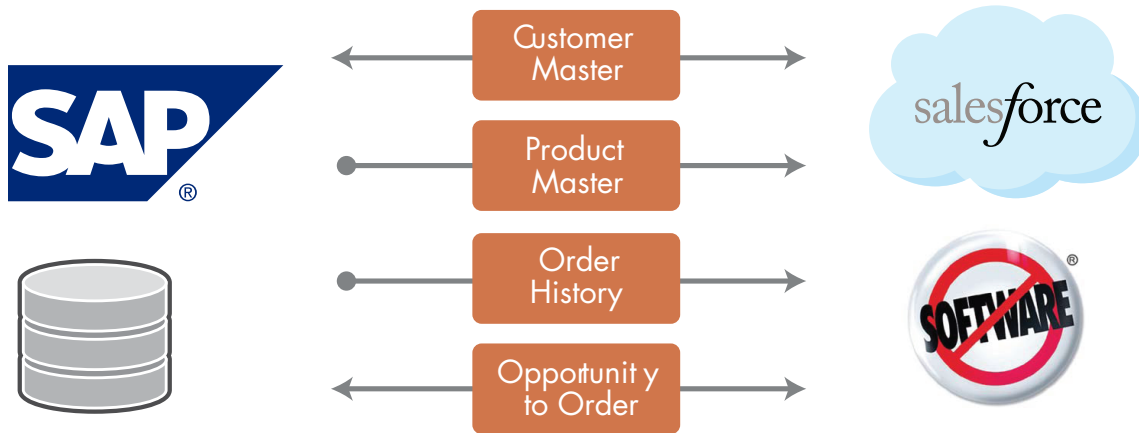
¹ Linthicum, David. "Best Practices in Leveraging a Staging Area for SaaS-to-Enterprise Integration."

Order and Financial Data Integration:

Every time a contact or account is viewed in salesforce.com, all related order history as well as the current financial status needs to be visible in real time to the salesforce.com user. In many cases, real-time drill down into orders is a requirement.

- Typically custom objects are created in the target CRM system, which are fed real-time SAP data whenever the contact or account is viewed. Informatica also enables real-time drill down into the underlying SAP data.

Informatica provides focused solutions to deliver Salesforce to SAP integration. Whether delivered in the cloud or on-premise, the Informatica Platform allows a salesforce.com customers to exchange information using a consistent, proven, durable, and low maintenance approach. And tailored solutions allow you to rapidly integrate and synchronize your CRM data with your corporate IT environment, inclusive of SAP, without having to invest in an entire data integration architecture.



About Informatica Cloud

The Informatica Cloud delivers enterprise-class software-as-a-service (SaaS) integration applications and a powerful platform for developing and deploying custom integration services to non-technical users over the web.

Informatica Cloud Services deliver purpose-built data integration cloud applications to allow business users to integrate data across cloud-based applications and on-premise systems and databases. Informatica Cloud Services address specific business processes (customer/product master synchronization, opportunity to order, etc.) and point-to-point data integration (e.g. Salesforce.com to on premise end-points).

The Informatica Cloud Platform takes advantage of the underlying PowerCenter data integration engine and includes online registration, user and task flow management, job scheduling and monitoring, error handling, compression, encryption and a secure agent to access and integrate cloud-based data with on-premise sources. With the Informatica Cloud Platform, customers and partners can build, manage, and share custom data integration services in the cloud.

About the Author

David S. Linthicum is an internationally recognized industry expert and thought leader, and the author and coauthor of 13 books on computing, including the best selling **Enterprise Application Integration** (Addison Wesley). Dave keynotes at many leading technology conferences on cloud computing, SOA, Web 2.0, and enterprise architecture, and has appeared on a number of TV and radio shows as a computing expert. He is a blogger for InfoWorld, Intelligent Enterprise, and eBizq.net, covering SOA and enterprise computing topics. Dave also has columns in Government Computer News, Cloud Computing Journal, SOA Journal, Align Journal, and is the editor of Virtualization Journal.

In his career, Dave has formed or enhanced many of the ideas behind modern distributed computing including Enterprise Application Integration, B2B Application Integration, and SOA, approaches and technologies in wide use today. For the last 10 years, Dave has focused on the technology and strategies around cloud computing, and how to make cloud computing work for the modern enterprise. This includes work with several cloud computing startups.

Dave's industry experience includes tenure as CTO and CEO of several successful software companies, and upper-level management positions in Fortune 100 companies. In addition, he was an associate professor of computer science for eight years, and continues to lecture at major technical colleges and universities including the University of Virginia, Arizona State University, and the University of Wisconsin.



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