



WHITEPAPER

SAP integration best practices

Table of contents

Executive summary	3
1. Integrate SAP to transform your business	4
2. Top 3 challenges to SAP integration	5
2.1 SAP's integration methods don't extend well to third-party systems	5
2.2 Inconsistent configuration increases complexity and costs	6
2.3 Specialized skill set requirements lead to slow delivery	6
3. How to solve SAP integration challenges	8
3.1 Technology: connect SAP to any app, data, or device	8
3.2 Process: abstract configuration complexity with an API-led approach	14
3.3 People: empower your teams to succeed	20
4. Getting started: SAP integration tools	25
Appendix	26
SAP integration methods	26
SAP connectors	27
SAP integration templates	28
About MuleSoft	29

Executive summary

[SAP](#) is a powerful enterprise resource planning (ERP) system. For enterprises running on SAP, figuring out the right strategy to integrate SAP with their other core business systems can be a challenge. The SAP ecosystem is complex. However, the right SAP integration strategy enables organizations to transform critical business functions such as accounting and financials, human capital management, supplier relationship management, enterprise performance management, and many others.

Businesses often encounter three challenges when integrating SAP to third-party systems and applications:

1. SAP's integration methods don't extend well to third-party systems.
2. Inconsistent configuration increases complexity and costs.
3. Specialized skill set requirements lead to slow delivery.

SAP integration requires the right technology, a strategic approach to connect SAP and third-party systems, and a means of enabling your organization to achieve success. MuleSoft addresses SAP integration across three domains:

1. **Technology:** MuleSoft's Anypoint Platform connects SAP to any app, data, or device.
2. **Process:** MuleSoft abstracts SAP configuration complexity with an API-led approach.
3. **People:** MuleSoft Catalyst empowers your teams to succeed, with industry best practices, playbooks, customer success programs, and professional services offerings.

Together, Anypoint Platform and MuleSoft Catalyst enable you to drive innovation and change the clock speed of your business.

1. Integrate SAP to transform your business

Digital transformation is about more than digitizing existing manual processes. It's an opportunity to reimagine your entire business, create best-in-class customer and partner experiences, drive incremental revenue, and increase employee productivity. A connected, agile IT landscape serves as the foundation for a successful business.

Core to delivering these outcomes is integrating disparate systems and technologies that unlock new business capabilities. SAP ERP often acts as the system of record or data master for much of an organization's data and transactions. Additionally, many non-SAP systems contain important customer and business information. And increasingly, companies rely on modern CRM systems to act as a system of engagement, where employees prefer to do their work. Thus, connecting all of these systems together is crucial to delivering the connected customer, partner, and employee experiences that bring digital transformation.

2. Top 3 challenges to SAP integration

The SAP ecosystem consists of countless, disparate technologies, including legacy on-premises ERPs, a more modern S/4HANA ERP, various SaaS solutions that SAP has acquired over the years, and multiple integration tools that seek to connect and navigate this complex landscape. Further, SAP ERP is notoriously challenging to integrate with other systems, given its proprietary language, logic, and processes that do not easily extend beyond the SAP ecosystem. Thus, the following three SAP integration challenges must be well understood and carefully considered when planning an integration strategy.

2.1 SAP's integration methods don't extend well to third-party systems

SAP provides a number of integration methods and interfaces to connect and manipulate data and processes. Instead of using existing industry standards, SAP has developed its own capabilities such as IDocs, BAPIs, ABAP, RFC, and JCo (see Appendix). SAP's proprietary offerings don't extend well to third-party systems and present significant integration challenges. For example, there are over 600 IDocs types that must be considered as part of an integration project. Additionally, BAPIs don't cover all available SAP transactions, and RFCs are often neither documented nor supported by SAP. Consequently, customers have to resort to a patchwork of integration solutions to solve various use cases, creating tightly-coupled, solution-specific, brittle connections that prevent organizations from adapting to future business changes.

2.2 Inconsistent configuration increases complexity and costs

One of the benefits of SAP ERP, including ECC, is that it is highly customizable to a business' needs, and many companies take full advantage of this flexibility. However, this customizability increases the complexity of integration, driving up the costs and the time to connect to new systems. As companies expand into new products, new verticals, and new markets, they often find the need to individually customize SAP modules to meet new and unique business needs. For example, a multinational corporation likely has different SAP instances in North America, Europe, and Asia, each with their own customizations. While these customizations best support each region's business operations, they present significant challenges for integration. And if a company acquires a competitor with its own SAP instance (or another ERP entirely), integration challenges only escalate.

Even when companies have consistent customization *within* their SAP ecosystem, their third-party solutions will have their own object models that won't match those of SAP. The more third-party software that is involved, the greater the mismatch, and consequently, the greater the challenge to integration. Navigating these idiosyncrasies without the proper tools quickly becomes insurmountable for many organizations.

2.3 Specialized skill set requirements lead to slow delivery

SAP's comprehensive suite of solutions, coupled with its multiple integration methods such as IDocs and BAPIs, rapidly leads to a complicated development and software delivery environment. In order to navigate this complexity, large teams of developers with specialized skill sets are required, forcing businesses to either build an SAP team in-house or hire SAP developers from systems integrators. Given both their complexity and their business-critical nature, SAP projects can

take months to complete. Meanwhile, line of business requests move into a backlog, awaiting prioritization and resourcing, often frustrating end users who need to innovate in real-time. This pain is particularly acute given the high percentage of critical data that is stored in SAP and due to its role as the organization's central system of record. Even when work begins on line of business projects, because of the complexity of SAP, what may appear to be a small request to update functionality will take considerable effort and time.

3. How to solve SAP integration challenges

In response to the challenges outlined above, it's imperative to choose the right technologies, the right approach, and to enable your teams appropriately. MuleSoft's Anypoint Platform and our [API-led connectivity](#) approach are oriented across all three domains to help you meet your most critical business objectives in the shortest timeframe while simultaneously laying the foundation for future growth.

3.1 Technology: connect SAP to any app, data, or device

Anypoint Platform is the leading platform for SAP integration and helps you connect SAP's on-premise and cloud-based solutions, SAP middleware, third-party legacy systems, and modern, best-of-breed technologies. To do so, MuleSoft provides a library of over 50 [SAP integration assets](#), including SAP-certified connectors ([ECC](#), [S/4HANA](#), [Hybris](#), [Concur](#), [SuccessFactors](#), and [BusinessObjects](#)) and [integration templates](#) between SAP and common endpoints such as Salesforce and Workday. We also provide over [200 total integration assets](#) to connect to the other systems in your technology stack.

Mule runtime engine supports SAP integration through an Anypoint Connector, which is an SAP-certified Java connector that leverages SAP Java Connector (JCo) libraries. The connector supports a number of SAP solutions, including ERP, Cloud for Customer, Supplier Relationship Management, Supply Chain Management, and any other modules compatible with the NetWeaver platform.

Through the [SAP Connector](#), users can enable Mule applications to:

1. Execute BAPI functions over the RFC protocol, supporting the following types:
 - a. Synchronous RFC (sRFC)
 - b. Transactional RFC (tRFC)
 - c. Queued RFC (qRFC)
2. Act as a JCo Server to be called as a BAPI over sRFC, tRFC and qRFC.
3. Send IDocs over tRFC and qRFC.
4. Receive IDocs over tRFC and qRFC.
5. Transform SAP objects (JCo Function/BAPI & IDocs) to and from XML.

With MuleSoft's SAP connector, you can use the RFC protocol to connect to NetWeaver Application Servers. Since SAP solutions run on top of NetWeaver, anyone using the SAP connector can access those systems and facilitate both outbound and inbound communications between applications and systems.

Unlike SAP interfaces, SAP Gateway, and other integration approaches, our connectors do not require specialized skill sets or custom development. They only require simple configuration, making it fast and easy to build SAP integration apps.



Learn more about our connector for SAP ECC and S/4HANA by reading the [supporting documentation](#).



Practical application: order to cash

Convincing customers to buy products and services is only part of the sales cycle, and many sales reps lack the tools to complete the entire transaction. Manual entry of sales orders in SAP is inefficient, and reps lack visibility if they cannot see fulfillment status within their CRM. In today's world, customers buy from companies that can serve them most quickly, efficiently, and accurately, and an efficient order to cash (O2C) process enables companies to do just that.

O2C is a complicated, multi-step process for businesses, involving data and transactions across a myriad of systems. Done correctly, O2C involves product inventory, pricing, quoting, orders, fulfillment, and communication at key milestones. In the best case scenario, opportunities are created and tracked in a CRM. But without integration to SAP and other downstream systems, subsequent steps involve multiple, manual processes with a variety of stakeholders. Employee productivity suffers as the risk of making errors increases, and ultimately so does customer satisfaction as the end-to-end process slows. With integration throughout the O2C process, sales reps can submit purchase orders directly within CRM, enabled by updated product catalogs and real-time inventory coming from SAP. Subsequent O2C steps are automated, including order fulfillment, delivery, invoicing, and payment.

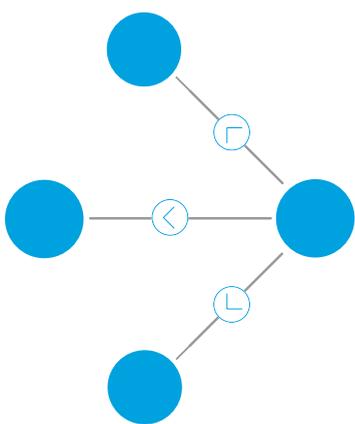


Figure 1: Broadcast pattern

For this solution, we recommend the [broadcast integration pattern](#), which moves data from a single source system to many destination systems in an ongoing and real-time (or near real-time) basis. The broadcast pattern is transactional, meaning that it executes the logic only for those items

that have changed recently. Because broadcast patterns are usually employed with little human oversight in mission-critical applications, they are optimized for processing records as quickly as possible in a highly-reliable manner to avoid losing data in transit. Within our O2C scenario, there are countless instances when you need to broadcast an order update from SAP to one or more receiving systems as soon as the event occurs. For example, order information needs immediate processing downstream to your order management system, regardless of whether the order was placed through an eCommerce channel or CRM.

Unlock your back office with SAP and Sales Cloud integration

The case for integration with Sales Cloud

MuleSoft's Anypoint Platform enables organizations to synchronize data and automate transactions between SAP, Sales Cloud, and other systems, enabling connected sales experiences that increase sales productivity by 26%. With SAP and Sales Cloud, customers can build automated order-to-cash processes with 3x faster order provisioning so that sales reps can focus on customers and selling instead of data entry.

Scenario: driving sales for Acme Corp

Imagine that you're a sales representative at Acme Corp, a large medical device manufacturing company. Acme Corp recently completed a digital transformation initiative to provide a unified view across the supply chain and improve workflows for placing and tracking orders by connecting SAP, Salesforce Sales Cloud, and other systems using MuleSoft.

You have been working for months on an opportunity, and as you are about to board your flight, you receive an email from your client, Christine, stating that she needs an immediate order for 500 Diagnostic Procedure Kits. Because SAP has been integrated with Sales Cloud, you're easily able to check inventory, pricing, and calculate the shipping details to send Christine an immediate quote, all from your mobile device in a single app.

After receiving Christine's approval, you close the opportunity within the Salesforce mobile app which automatically creates an order in SAP. Subsequently, Christine receives automated order, shipping, and delivery notifications, all enabled through integration between SAP, Sales Cloud, and other systems.

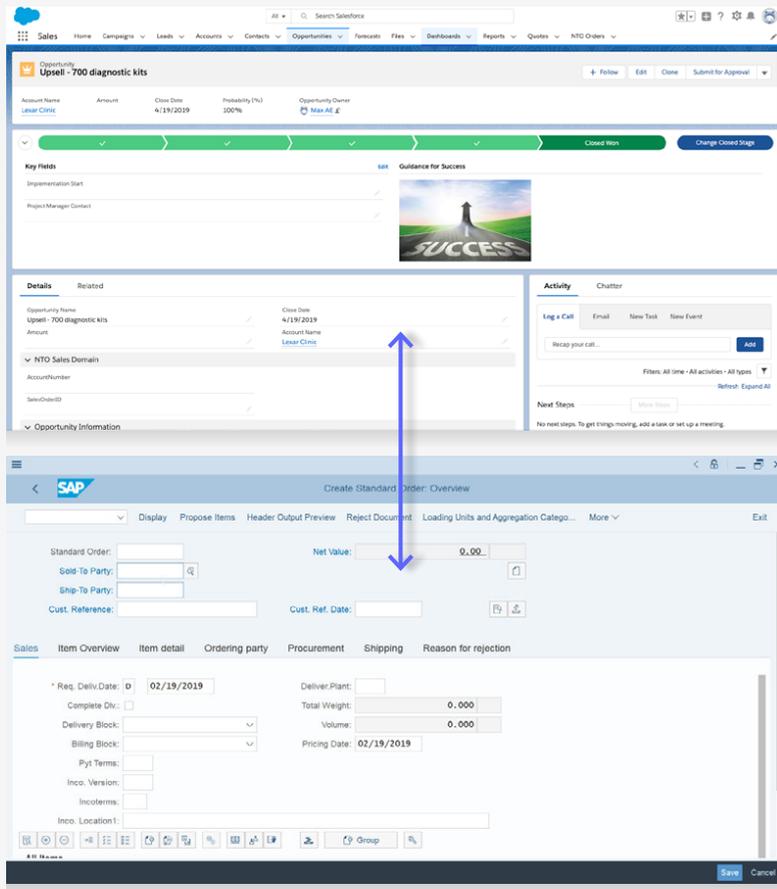


Figure 2: With Salesforce Sales Cloud to SAP integration powered by MuleSoft, customers can unlock SAP data (e.g. master product lists, pricing, and inventory) and automate business processes, such as order-to-cash, directly within Sales Cloud.

Global manufacturing company increases speed of delivery 3x with MuleSoft

A global manufacturer was unable to keep pace with the demands of their sales team because the quoting solution and ERP could not integrate, requiring error-prone manual data entry. By developing reusable APIs with MuleSoft to connect SAP, Salesforce, and other systems, the manufacturer was able to accelerate project delivery and meet the demands of the business, like adding a new SKU and provisioning orders quickly. Using Anypoint Platform's drag-and-drop functionality and pre-built SAP and Salesforce [templates](#), the manufacturer tripled the speed of integration. And best of all, the company improved the customer experience by providing sales and service teams with data clarity, data reconciliation, and a real-time single view of customers.

The benefits of SAP and Sales Cloud integration

- **A connected selling experience:** connect SAP and Salesforce easily with out-of-the-box connectors and a robust library of Salesforce integration templates to speed up development.
- **A single view of customers:** consolidate information in real-time, with [bi-directional synchronization templates](#), to ensure data consistency across applications, geographics, business units, and departments.
- **Increased sales productivity:** fuel smarter reporting and analytics with Sales Cloud Einstein, now connected with richer data from SAP and third-party systems to make your sales team more efficient.

3.2 Process: abstract configuration complexity with an API-led approach

Regardless of how customized your SAP instance(s) may be, or how mismatched the object models may be between SAP and third-party solutions, Anypoint Platform is purpose-built to abstract the complexity of any system and its proprietary language. This results in obviating the need to build with custom code by leveraging an [API-led approach](#). API-led connectivity provides a means of connecting and exposing SAP and other systems with APIs. With this approach, every asset, application, or system becomes a managed, modern, developer-friendly API that is discoverable through self-service while maintaining the security policies you've designed.

APIs allow you to mediate SAP customizations and logic while orchestrating across multiple systems, simplifying your integrations between connected applications while creating a scalable, plug-and-play infrastructure. Once these APIs have been built, multiple business lines and stakeholders can use [Anypoint Exchange](#) to discover, collaborate, and reuse these integration assets, reducing the burden on central IT while standardizing integration best practices. These APIs play specific roles - unlocking data from systems, composing data into processes, or delivering particular experiences to end users - and these roles can be illustrated through the three-layered architecture below. In this particular scenario, API-led connectivity exposes multiple SAP ECC instances from different regions, Salesforce Service Cloud, and other third-party systems as managed APIs that provide key data from the underlying systems.

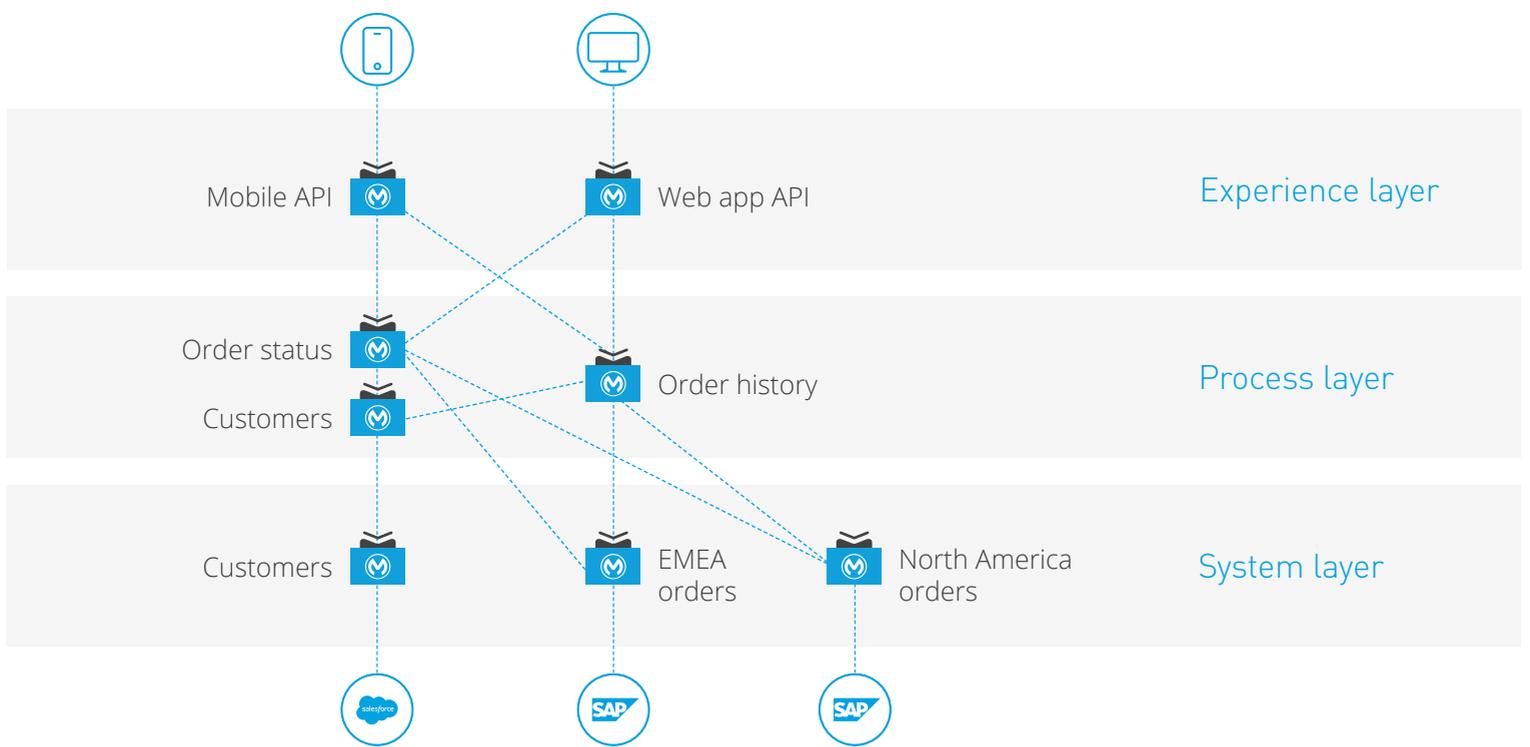


Figure 3: API-led diagram

- Systems APIs:** This layer unlocks data from SAP, Salesforce, and other systems, providing consistent, managed, and secure access to each system. The SAP connector can use either RFC calls or BAPI functions and/or IDoc messages for data exchange. Thus, the first step is to create an SAP system API, which hides the complexity of SAP from a user (leverage our [SAP system API template](#) to get started). This API abstracts account data from SAP into canonical objects that we define within the Salesforce system API, using JSON as an exchange format to translate calls into the semantic data structure required by SAP. In this case, we have two different SAP instances with their own customizations, but those complexities are abstracted through the canonical data model. Similar processes would be followed for each additional system.
- Process APIs:** Build upon system APIs by leveraging core data from each system, combining them with the necessary business logic to achieve a business goal. For example, you may want to combine customer data from SAP and Salesforce into process APIs called “Customer API” and “Order status API.” These APIs are loosely coupled and can be reused for future integration projects.

- **Experience APIs:** This layer is designed to enable the consumption of underlying APIs for specific end-users within an application or particular device. By decoupling the user interface from the underlying data, front-end developers can innovate quickly without having to understand the underlying back-end systems.

The principle of API reusability is a significant benefit of MuleSoft's API-led connectivity approach, allowing new integrations to leverage previous work, thereby accelerating development. By using an API-led approach, you can liberate SAP and other systems with APIs, avoiding the configuration complexity that plagues many organizations, and drive agility and speed while reducing costs.



Practical application: **issue to resolution**

Service agents have difficult jobs, working diligently to resolve the problems of unhappy customers. What's more, the role of service agents is transforming. Customers increasingly expect agents to possess expertise across multiple domains, including the ability to provide recommendations about products and services. These evolving requirements necessitate providing agents with more capabilities than ever before, enabled by access to products, pricing, inventory, order status, and more. To achieve these capabilities, organizations need to integrate SAP with customer service applications, providing agents with a single view of their customers and the ability to transact.

A single view of customers allows agents to see order status, delivery status, and other data without having to swivel chair into SAP and other systems of record. Additionally, the ability to transact enables agents to serve their customers better (example: reordering a package that was lost-in-transit) and allows service agents to sell additional products and services.

Best of all, these capabilities result in better customer experiences while increasing agent productivity.

To provide agents with a single view of customers and the ability to transact, all within a unified experience (say, in Salesforce Service Cloud), we use an API-led connectivity approach. To synchronize data between SAP, Salesforce, and other systems, we use a publish-subscribe integration pattern, a modularized approach to integration allowing us to decouple source and destination systems. Publisher clients address messages to a topic that serves as a bulletin board, while subscriber clients dynamically consume these messages by subscribing to that topic. The system takes care of distributing the messages to all present subscribers at the time the message arrives, and it ensures that the messages are reliably delivered just once to each subscriber.

With SAP providing order management and inventory management while using Service Cloud for customer support, pub-sub enables your company to maintain a consistent, real-time view of the data in every system. If a customer needs a replacement product, your agent will 1) know what they previously ordered, 2) have access to the latest product catalogs, 3) have visibility into inventory and shipping lead times, and 4) be able to reorder the product, all accomplished within Service Cloud. This drives significant time and cost savings across your entire call center.



Learn more about publish-subscribe patterns by reading [this blog post](#).

Transform your call center with SAP and Service Cloud integration

The case for integration with Service Cloud

MuleSoft's Anypoint Platform enables organizations to synchronize data and automate transactions between SAP, Service Cloud, and other systems, enabling connected service experiences that increase agent productivity by 40% and customer satisfaction by 35%. With SAP and Service Cloud, customers can build a connected platform to provide superior service across existing and emerging channels.

Scenario: providing first class customer support

Imagine that you are a service agent for a popular eCommerce website, and a customer named Esther has been assigned to your queue. All of Esther's information pops onto your screen: Her profile, order history, loyalty status, shipping and delivery information, and more. Esther indicates that her recent order was not delivered, and after gathering additional information, you reorder Esther's product with expedited shipping. You also decide to issue her a \$10 credit for her troubles. Best of all, you were able to accomplish all of these tasks with just a few clicks in your Service Cloud console without having to swivel chair into other apps, enabled through integration between SAP, Service Cloud, and third-party systems.

Global CPG company drives 25% productivity increase

A global CPG company was experiencing pressure to connect with their customers through a variety of channels. Using MuleSoft, the company connected SAP, Service Cloud, and other core systems to unlock product, shipment, and order history information. By building with reusable APIs, the CPG company was able to surface real-time customer and order data across all channels of engagement, from web to mobile to chatbots. These efforts resulted in increasing agent productivity by 25% and enabled their teams to provide a best-in-class experience for their customers.

The benefits of SAP and Service Cloud integration

- › **A connected service experience:** Quickly connect SAP and Salesforce directly with out-of-the-box connectors and a robust library of Salesforce integration examples and templates to speed up your development across channels of service.
- › **A single view of customers:** Empower employees by consolidating all customer information in a “single pane of glass” by unlocking relevant information from any application into your ecosystem like order history, recent support tickets, upcoming renewals, and product utilization.
- › **Increased agent productivity:** Reduce average handle times by eliminating the requirement to swivel chair into other systems and enable business process transactions directly within Salesforce.



Practical application: **S/4HANA migration**

With 2025 rapidly approaching, now is the time to prepare for SAP's ECC end-of-life. Whether you're planning on migrating to [S/4HANA](#) or another solution, MuleSoft's API-led approach allows you to connect multiple ERPs while abstracting the idiosyncrasies of each endpoint, decoupling them from front-end systems. This approach allows for a phased rollout, running both ECC and S/4HANA in parallel. When you're ready, you can begin migrating data to S/4HANA without any loss of data or system downtime. If you decide to move to a non-SAP ERP, these same techniques enable migrating to a new vendor with the same results.



To learn more about S/4HANA migration, read our whitepaper, [Integrating SAP S/4HANA](#).

3.3 People: empower your teams to succeed

Anypoint Platform is a modern platform based on industry-standard technologies and development tools that your developers are already familiar with, reducing training and staffing requirements, development costs, and the time it takes to realize value. Anypoint Platform uses an Eclipse-based environment with an intuitive drag-and-drop interface to accelerate development. Or, when desired, developers can get right into the code by using XML. Default support for Apache Maven and easy integration with CI/CD systems, such as Jenkins, accelerate integration projects. Because Anypoint Platform is easy to use and integration assets are easy to share in [Anypoint Exchange](#), line of business IT teams have the power to drive innovation without having to wait for SAP developers or other specialized resources.

While Anypoint Platform is easy to learn, technology, alone, is insufficient to drive business transformation. Research shows that most IT projects fail to be delivered on time, on budget, or meet the business objectives. This is generally due to a lack of alignment around business outcomes as well as organizations not being enabled to deliver success. Instead, companies must have the right operating models, organizational structures, and approaches to execution in order to be successful.

To address these challenges, we've developed [MuleSoft Catalyst](#) to ensure you are successful in achieving your desired business outcomes. MuleSoft Catalyst is a unique delivery methodology and set of packaged offerings that include best practices, assets, services, training, industry accelerators, and customer success programs. This flexible approach enables multiple engagement models: you can drive the approach within your organization by leveraging the assets and best practices developed by MuleSoft experts. In this model, MuleSoft's Customer Success team serves as a guide throughout the journey. Alternatively, you can use a services-led engagement driven by MuleSoft [Professional](#)

[Services](#) or your preferred partner. Whichever path you choose, you will have the resources to realize the full potential of your digital transformation initiatives.

 Practical application:
outcome-based delivery

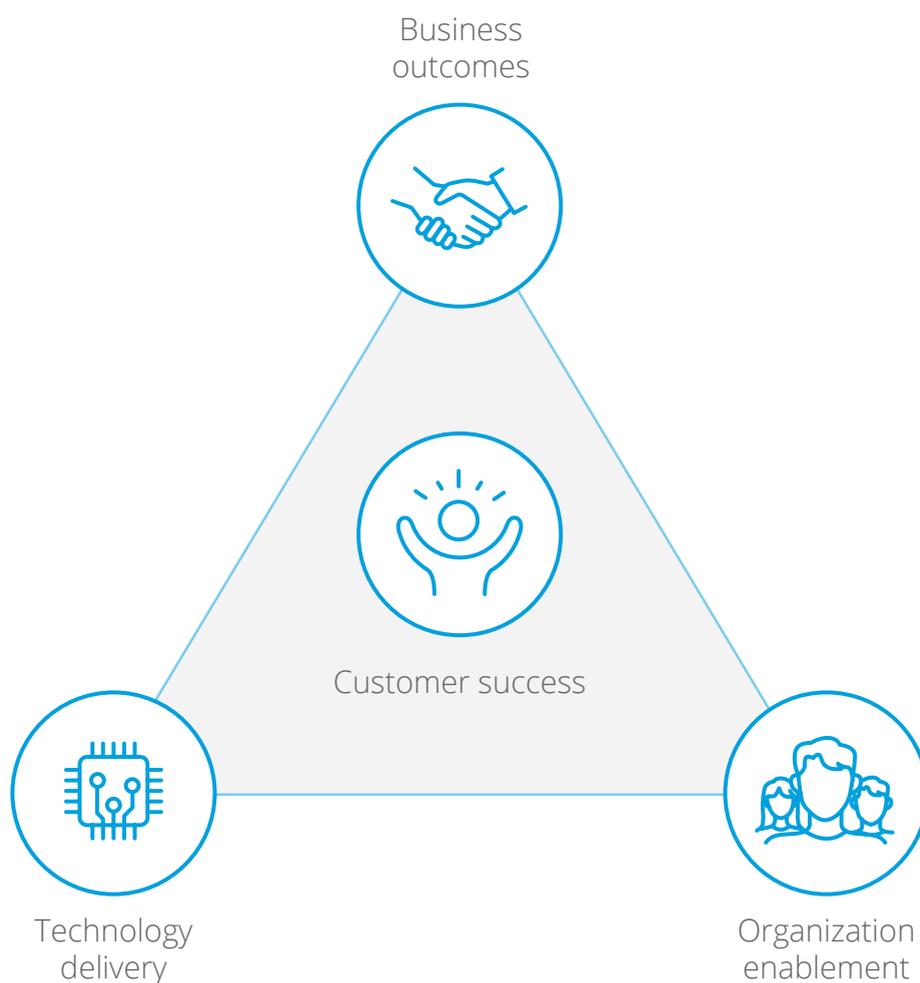


Figure 4: MuleSoft Catalyst’s outcome-based delivery methodology

MuleSoft Catalyst is designed to deliver customer success, and one of the key components to doing so is our outcome-based delivery methodology of aligning to three core pillars: business outcomes, technology delivery, and organizational enablement. Even with the right technology, organizations face an uphill battle when they lack alignment and enablement. MuleSoft Catalyst defines clear a path to success across each pillar. Our methodology is codified into rich playbooks—step-by-step guides containing best practices with recommended activities and steps to accelerate success. This includes blueprints to

track the achievement of each desired business outcome as your API-led adoption and integration implementations mature. As an overview, here is what you can expect across each pillar:

- **Business outcomes:** Define clear outcomes and KPIs with stakeholder alignment.
- **Organizational enablement:** Ensure organizational readiness with Anypoint Platform.
- **Technology delivery:** Enable platform availability and team readiness to build APIs and integrations.

Our methodology has been designed around API-led connectivity, decoupling core IT projects from the innovation that each line of business creates. To truly deliver on this model, organizations greatly benefit from an internal team that drives both alignment and organizational enablement, and in the MuleSoft Catalyst framework, this team constitutes a [Center for Enablement \(C4E\)](#). This methodology applies to businesses of all sizes; we've seen one-person C4Es drive enormous success. As part of the MuleSoft Catalyst methodology, we provide the assets to help you stand up and enable your C4E in Catalyst Knowledge Hub, and if desired, MuleSoft's Customer Success teams, Professional Services, and our partners are available to guide you.

A C4E driving API-led connectivity delivers value by enabling people while promoting best practices. More specifically, the C4E helps break down silos by training cross-functional teams and promoting awareness throughout the organization. The C4E also promotes the concept of integration asset reusability, driving decentralized and productized APIs. With this approach, central IT generally focuses on connecting and abstracting systems of record while line of business IT consumes and builds on top of these core assets, delivering customer-facing innovation. Anypoint Platform supports this approach with [Exchange](#), where central IT makes integration assets available, including versioning, documentation, and identifying

dependencies, upon which line of business IT builds. Further, business lines can reuse assets from other teams instead of having to solve the same challenges again. The outcome of these efforts is the accelerated delivery of integration projects aligned with best practices, security policies, and internal standards.

As previously discussed, SAP is a vast landscape of disparate systems and applications, and SAP ERP involves having to understand complicated frameworks, such as IDocs, BAPIs, and ABAP code. Central IT has the resources to unlock SAP ERP and other systems of record, according to the organization's best practices. When those underlying systems change (see Figure 3), the abstraction provided by API-led connectivity ensures that there are no upstream impacts to line of business IT. Ultimately, this allows IT to focus on delivering value to their business partners, maintaining the agility required to remain competitive.

Global manufacturing company drives 30% asset reuse

One of the largest manufacturers in the world has struggled to remain agile, as the number of systems and technologies continues to explode. Looking for ways to connect SAP and other systems to their latest internet of things, business automation, and data analytics initiatives, they adopted Anypoint Platform to create connected experiences across hundreds of business units. This company recognized the imperative to break down silos and drive alignment across people, process, and technology. To do so, they adopted MuleSoft Catalyst and our outcomes-based delivery approach, standing up a global Center for Enablement to institute API-led connectivity. This global C4E was able to drive alignment, best practices, and internal enablement for business lines all over the globe, resulting in 30% asset reuse. Now, these business lines are able to save considerable development time and cost while accelerating their global initiatives and business outcomes.

4. Getting started: SAP integration tools

Business transformation is a moving target, and the key to driving success is remaining agile while building a strong partnership between business and IT. The right technology, approach, and people are all required to deliver innovation, and Anypoint Platform with MuleSoft Catalyst best prepare you to achieve success.

Uniquely built as a single solution, Anypoint Platform is the only platform for designing, building, running, managing and monitoring both APIs and integrations, whether on-premise, in the cloud, or in a hybrid environment. From SAP to legacy systems to best-of-breed SaaS applications, MuleSoft's single platform eliminates the need to navigate multiple, disparate tools across your organization, greatly increasing the speed of development and innovation.

Customer success is driven by the intersection of people, process, and technology, and we have built a platform, ecosystem, and methodology to do just that:

- **People:** MuleSoft Catalyst empowers your teams to succeed, with industry best practices, playbooks, customer success programs, and professional services.
- **Process:** API-led connectivity abstracts SAP and other systems' complexity, driving reuse of integration assets, allowing your organization to accelerate innovation with each subsequent project.
- **Technology:** Anypoint Platform is a modern, easy to learn platform for both integrations and APIs, allowing you to connect SAP to any app, data, or device with hundreds of pre-built integration assets.

Appendix

SAP integration methods

SAP provides a number of elements, data structures, and modules to enable integration with its solutions. Below is a summary of the various approaches, all of which are supported by MuleSoft's Anypoint Platform.

Intermediate Documents (IDocs)

IDocs is a standard data format defined by SAP for the exchange of information between SAP and non-SAP applications. IDocs are typically used when information needs to be sent to or from SAP without notification requirements, primarily used to transfer master data in and out of SAP. For example, using IDocs, you can retrieve suppliers, cost centers, activity types, logistics information such as a bill of materials, and much more.

Business application programming interface (BAPI)

BAPIs are defined interfaces that can be called either by either SAP or non-SAP applications, typically in synchronous scenarios. For example, if an organization needs to manipulate its cost center from an external application, BAPIs allow for retrieving a list of profit or cost centers, and even creating new ones. Likewise, a customer could use BAPIs to plan new orders or change existing ones. There are hundreds of BAPIs available that provide a broad set of functions for SAP integration.

SAP Java Connector (JCo)

SAP JCo facilitates communication between an SAP backend system and a Java application, allowing Java programs to connect to SAP systems and invoke Remote Function Modules. JCo also allows parsing of IDocs, among other object types, and supports synchronous, transactional, queued, and background RFC.

OData

SAP Netweaver Gateway exposes data as REST or OData APIs, and SAP supplements the data types that are used from the ABAP Data Dictionary. Typically, an OData service is built based on BAPIs, meaning that the BAPI is exposed and consumed using the OData format.

Advanced business application programming (ABAP)

ABAP as a foundation for many applications offers a broad range of integration and connectivity technologies for remote SAP and non-SAP systems. Universal internet protocols, such as HTTP(S), and data formats, such as XML and SOAP, can be used as well as SAP-proprietary protocols and formats such as RFC/BAPI, IDoc, and ALE/EDI. Developers can expose ABAP-based functionality as a web or enterprise service by publishing the service definition in the Enterprise Service Repository, creating a server-side proxy, and implementing the service using the ABAP programming language.

SAP connectors

- › [ERP \(ECC and S/4HANA\)](#)
- › [Hybris](#)
- › [Concur](#)
- › [SuccessFactors](#)
- › [BusinessObjects](#)

SAP integration templates

- › [Account System API - SAP Implementation Template](#)
- › [Salesforce and SAP Account Customer Bidirectional Sync](#)
- › [SAP to Salesforce Product Material Broadcast](#)
- › [SAP to Salesforce Product Material Migration](#)
- › [SAP to Workday Employee Migration](#)
- › [SAP to Workday Organization Migration](#)
- › [SAP to Salesforce Customer Broadcast](#)
- › [Salesforce and SAP Account Aggregation](#)
- › [SAP to Salesforce Contact Migration](#)
- › [SAP to Workday Organization Broadcast](#)
- › [SAP to Salesforce Contact Broadcast](#)
- › [SAP to Salesforce Customer Migration](#)
- › [Salesforce to Salesforce, Workday, SAP, and Database Account Broadcast](#)
- › [Salesforce and SAP Product Bidirectional Sync](#)
- › [Workday to SAP Worker \(Employee\) Migration](#)
- › [Salesforce to SAP Opportunity Broadcast](#)
- › [Salesforce to SAP Opportunity Migration](#)
- › [Salesforce to SAP Account Migration](#)
- › [Salesforce to SAP Account Broadcast](#)
- › [Salesforce to SAP Product Broadcast](#)
- › [Salesforce and SAP Product Aggregation](#)
- › [Workday and SAP Worker \(Employee\) Aggregation](#)
- › [Workday to SAP Worker Broadcast](#)
- › [Workday and SAP Organization Aggregation](#)
- › [Salesforce and SAP Opportunity Aggregation](#)
- › [Account Migration Process API](#)
- › [Account System API - Database Implementation Template](#)
- › [Product API | Hybris Implementation Template](#)

About MuleSoft

MuleSoft, a Salesforce company

MuleSoft's mission is to help organizations change and innovate faster by making it easy to connect the world's applications, [data](#), and [devices](#). With its API-led approach to connectivity, MuleSoft's market-leading Anypoint Platform™ empowers over 1,600 organizations in approximately 60 countries to build application networks. By unlocking data across the enterprise with application networks, organizations can easily deliver new revenue channels, increase operational efficiency, and create differentiated customer experiences.

For more information, visit mulesoft.com

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