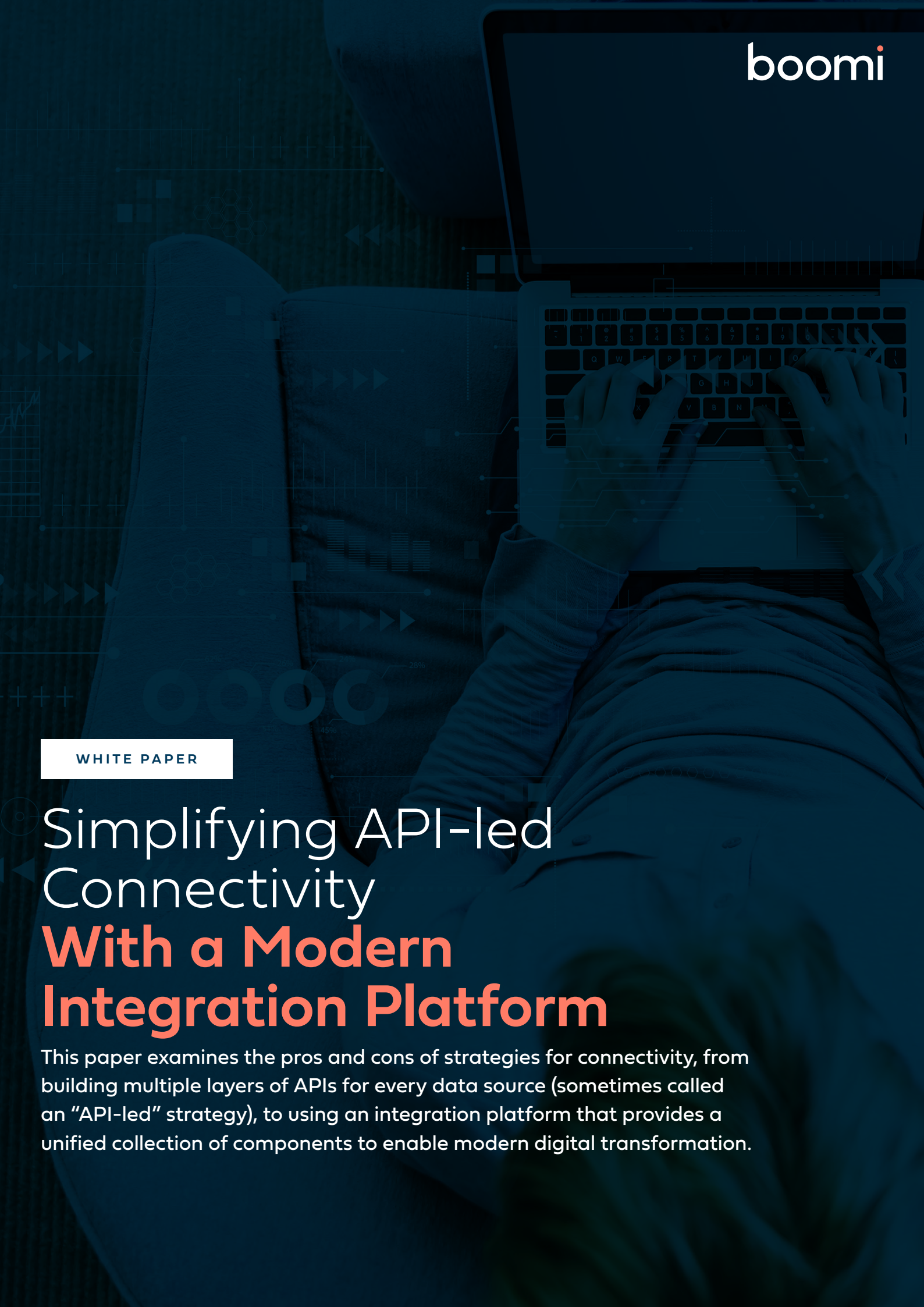

boomi

WHITE PAPER

Simplifying API-led Connectivity **With a Modern Integration Platform**

This paper examines the pros and cons of strategies for connectivity, from building multiple layers of APIs for every data source (sometimes called an "API-led" strategy), to using an integration platform that provides a unified collection of components to enable modern digital transformation.

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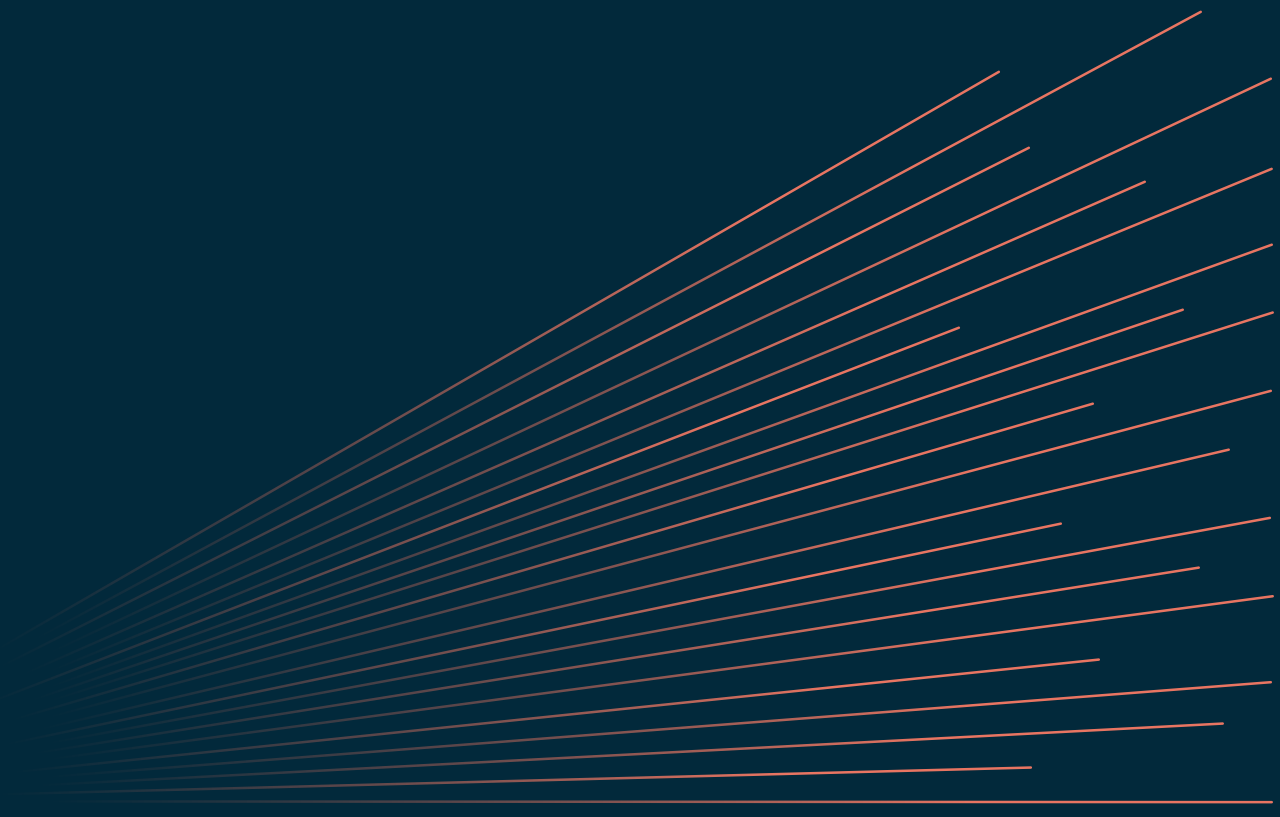

> **Digital transformation projects require an integrated digital framework for rapidly** connecting application endpoints seamlessly with trusted data through automation and user engaged processes.

INTRODUCTION

Businesses in every industry are embarking on bold digital transformation initiatives to instantly connect everyone to everything. Innovative projects such as self-service apps for telehealth, remote education, e-grocery, flexible office apps, fintech, and automated compliance reporting provide exciting digital offerings to deliver faster collaboration between customer, employees, partners, applications, and data. To be successful, these projects require an integrated digital framework for rapidly connecting application endpoints seamlessly with trusted data through automation and user engaged processes.

More specifically, these digital frameworks require **six key components or functional areas:**

- **Integration** of both applications and data
- **Application Programming Interface (API)** design, management, and governance for access to applications and other data sources
- **Master data management (MDM)** to build a single source of truth of trusted data across the organization
- **Workflow automation** for faster collaboration
- **Data catalog and preparation** for data discovery, data cleansing, and data quality
- **EDI** so trading partners can integrate with automated workflows and new digital transformation initiatives

Although there are many approaches to integration, this paper will examine two that deliver the foundation for digital transformation: a platform-based approach with integration platform as a service (iPaaS) supporting a wide range of integration patterns, and starting with a focus on the API-led connectivity pattern.

iPaaS offers a single, comprehensive platform supporting all six key components of integration listed above. Because the platform is built to support all these components, companies typically start with the core integration foundation of iPaaS and one or two other components, then add more over time to support their digital transformation initiatives. Since all the components are part of a single platform, they interoperate without requiring extensive customization.

For example, standalone API management outside of iPaaS might not have direct access to the data quality capability of MDM and therefore provide APIs of questionable data quality. Inside iPaaS, API management has seamless access to data quality without the need for additional integration to external MDM. Likewise, API management inside an iPaaS provides prebuilt API enablement of all workflows, EDI, data management, and integrations for reuse for future digital transformation projects without the need for building new APIs.

In contrast to an iPaaS approach, an API-led connectivity strategy leads with a focus on the API component of an integrated digital framework. Traditional API-led connectivity adds three additional API layers (system, process, and experience) that are built first, with the goal of future projects being able to leverage the APIs in these layers for faster time to market.

APIs are sometimes referred to as the "doors" to access data inside applications and data sources. Using a construction analogy, designing the doors first (i.e., building APIs before other software components)

instead of at the same time as the plumbing, electrical, foundation, and drywall, can be problematic. Significant retrofitting and cost might be required if plumbing or foundation requirements force changes to the doorways already put in place. Likewise, before you know the room size can be problematic when you need to fit a grand piano through the entrance.

Although some level of foundational integration APIs can be very useful, building an entire API-led library independently from the other integration components such as EDI, data catalog and preparation, application and data integration, and MDM, with the intent of significant future reuse, can be costly and risky.

An API-led connectivity strategy can work well when future project needs are predictable enough for the IT organization to accurately forecast the reuse of APIs. If reuse is high, the ROI for investing in APIs upfront is also high. If reuse is low, then the upfront time and cost to add the three additional API layers can result in a heavyweight foundation that delays and complicates the transition to digital transformation.

As the expectation for delivering digital transformation results has steadily dropped from years to months to weeks — and sometimes days (as experienced during the pandemic), forecasting future reuse has become more difficult. For a growing number of companies, a different strategy is needed.

A recent survey of more than 150 companies that deployed software based on the three-tiered API-led connectivity strategy found that the top two reasons why companies were considering alternatives to their API-led connectivity software vendor were "cost is higher than anticipated" (48 percent) and "our organization was not ready for API-led integrations" (41 percent).

In contrast, the integrated design of iPaaS has addressed these challenges of cost and complexity, as well as faster time to value, by having reusability embedded into the design of a modular and component-based platform. This eliminates the need for development time, money, or cost to reuse integration components.

Companies can instead build APIs — and API-led connectivity — with a very different approach, as part of a comprehensive iPaaS for a more responsive foundation for digital transformation. This agile, lightweight, API-led approach eliminates the security, maintenance, and latency overhead of adding additional layers of APIs on top of the existing application and data endpoint APIs.

This document provides cases studies, analyst statements, functional comparisons, and data from research interviews with more than 150 customers that provide insight into these findings.

API-LED CONNECTIVITY

The strategy of API-led connectivity is to make essentially all software assets consumable through APIs so any future application or service can access them if needed. An API-led connectivity strategy calls for a multi-tiered library of software services accessible on top of the native APIs for services calling business applications such as SAP, Workday, Salesforce, Oracle NetSuite, and many other SaaS and legacy data sources.

Specifically, traditional API-led connectivity adds the following three layers of APIs:

- **Experience APIs**, which lie directly underneath the user experience interface such as a mobile device, IoT, desktop app, etc.
- **Process APIs**, which provide access to custom business logic and data transformation as well as aggregating APIs from the System API layer.
- **System APIs**, which provide access to applications, databases, and other data sources.

"

The top two reasons why companies consider alternatives to their API-led connectivity software vendor are:

48% — Cost is higher than anticipated

41% — Our organization is not ready for API-led integrations

Cascade Insights,
2021 Research Study: Boomi Is an Excellent Choice for GSIs

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Once APIs have been built and published, developers can combine them to build new applications and services.

The diagram below shows a simplified view of how these APIs might be structured for an ecommerce scenario.

This notion of assembling API services into applications instead of relying on monolithic applications might seem familiar to those of you who have used Service-Oriented Architecture (SOA). Let's look next at SOA and what lessons we can learn from the adoption and eventual transformation of that architectural style.

API-LED CONNECTIVITY RESULTS AND LESSONS LEARNED

WHAT WE CAN LEARN FROM SOA

Before the introduction of API-led connectivity, the software paradigm most associated with the idea of creating applications from a collection of small, connected components, was SOA. SOA, which emerged as a highly popular architectural style after the millennium, advocated replacing large, monolithic applications with collections of small-scale, independent services. A new generation of protocols, including simple object access protocol (SOAP) and Web Services Security (WS-Security), were developed to support connections between these services.

Companies that deployed SOA software suites benefited significantly from innovations such as pre-built application connectors, orchestration workflow, data transformation, and more. The SOA methodology proved successful in cases where service libraries were reused often enough to offset their design and maintenance costs.

One characteristic of SOA that contributed to its eventual demise was the difficulty IT organizations had in predicting which services would be reused often enough to justify their creation. As businesses looked for even faster time to value for connecting applications and processes, they found themselves bogged down building and maintaining a growing number of API service libraries that were reused rarely. Eventually, many IT teams were spending over 70 percent of their budget on maintaining old APIs and integrations, rather than building new products and services to move their businesses forward.

Now that three-tiered API-led connectivity has passed the early adopter phase, it is showing some of the same challenges as SOA in terms of lack of reuse of APIs, plus high development and maintenance costs. Your strategy (i.e. SOA or API-led connectivity) should not predict future needs (for reuse) and also should not dictate which use cases can be optimally solved.

To understand this challenge, it's useful to gain insight from real-world deployments to assess API-led connectivity and rethink how to put in place the business connectivity strategy best suited to meet the requirements of modern digital transformation.

THE EXPERIENCE OF EARLY ADOPTERS OF API-LED CONNECTIVITY

API design and management are a critical success factor for most large-scale integration projects. However, it's important not to conflate "API design and management" with "API-led connectivity."

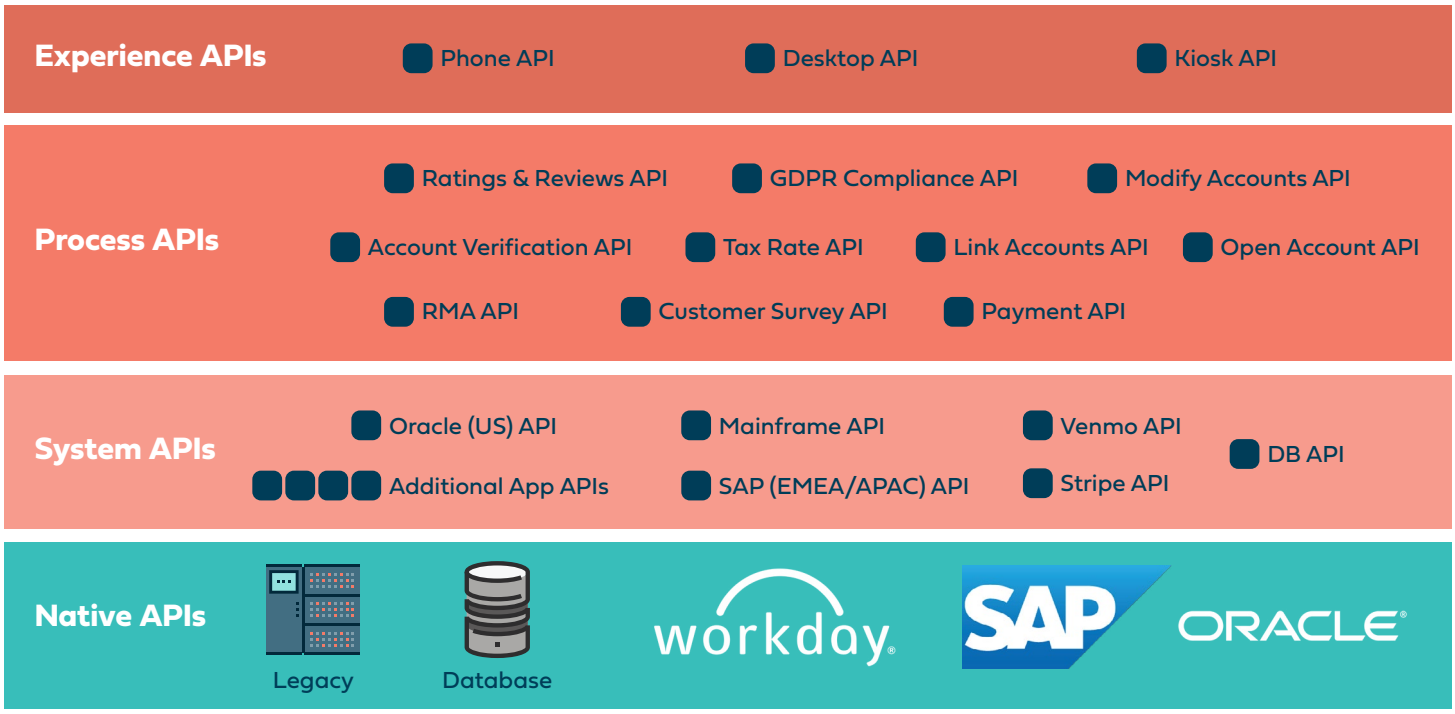


Figure 1 – The 3 layers of traditional API-led connectivity with example APIs

Despite the significant returns customers are receiving from API design and management, many customers who are relying on three-tiered API-led connectivity are not finding the right level of success.

Despite the significant returns customers are receiving from API design and management, many customers who are relying on three-tiered API-led connectivity are not finding the same level of success. The time and cost needed to deploy an API-led connectivity strategy can be far greater than companies had planned when making the original purchase.

As mentioned in the introduction, 41 percent of the 150 customers surveyed self-reported that their organization was "not yet ready for API-led integrations."

In addition to challenges with API-led integration, "cost is higher than anticipated" was the #1 reason (48 percent) given by customers who were considering alternatives to vendors promoting API-led connectivity. Ease of use was the third-ranked concern.

Some early adopter businesses are finding quantitatively that their three-tiered API-led connectivity strategies are not paying off as hoped. For example, a leading auto manufacturer recently abandoned its multimillion-dollar investment in API-led connectivity after finding that:

- **Fewer than 40 percent of APIs were being reused.** Most of the APIs the company had built and published were sitting idle and not reused for additional purposes.
- **Almost 500,000 lines of additional code were required.** Despite being unused, the APIs still needed to be maintained and after deploying nearly a half-million lines of code, the cost and effort was significant.
- **Over $1 million in costs were incurred before the manufacturer transitioned away.** Despite substantial investment of software and consulting costs, the company still didn't have the integrated digital framework it needed.

THE TRADEOFF BETWEEN REUSE AND COMPLEXITY

If most APIs are reused frequently, then a company's investment in designing, coding, testing, and maintaining these APIs makes sense. Future projects will be able to draw on APIs from prior projects. Development time overall will be accelerated.

When businesses can predict the projects they'll be taking on for years ahead, an API-led connectivity strategy can pay off. But when the pace of change accelerates, or when unpredictable changes in markets, technology, or economics take place — such as those driven by the COVID-19 pandemic — then companies need to respond with more agility. An API built six months ago might no longer be useful 18 months from now. Companies may instead need a more flexible and efficient model for software development.

Businesses that deploy a traditional, three-layered API-led connectivity architecture (distinct from API-led connectivity embedded in iPaaS) have the potential to dramatically increase complexity over time. The common problem of creating new point-to-point integrations for every project (i.e. custom-coded Salesforce to NetSuite integration) results in a difficult to maintain point-to-point architecture of n*(n-1)/2 integrations with just a single layer of APIs, where n represents an endpoint such as NetSuite. Adding three new layers of APIs accelerates this complexity significantly.

In Figure 2, a diagram of interconnected APIs shows the complexity inherent in an all-API approach for just one ecommerce use case. Layer in every current and future use case, and the complexity and cost become overwhelming.

In a perfect world, where companies have infinite time and resources, the idea of having the technology (APIs) come first and lead the business initiatives would make sense. There would be an API for every possible future service that might need to be assembled into an application.

GARTNER® COMMENTS ON APIs*

Leading analysts point out that there's no need to build new APIs when other means of connectivity are available.

"Eliminate wasted efforts associated with building excessive APIs for integration by reusing the existing APIs that are offered as an entry point to an interface."

"Many applications already provide native APIs that can be used directly, and you should only create new APIs in front of them to simplify consumption."

*Gartner, "Ensure Your Integration Strategy Supports Modern Integration Trends," Abhishek Singh and Eric Thoo, February 23, 2021

In reality, companies have tighter deadlines than ever before and the resource constraints for which IT is infamous.

Spending additional time on adding reuse into components of every digital transformation project is no longer acceptable. As we will see, modern iPaaS connectors, processes, mapping, data management, API management, and more have reuse embedded as part of the platform. Users no longer have to spend time making an API, process instance, or integration artifact reusable, because all these components already are reusable by design. This dramatically reduces unnecessary development, enabling businesses to focus on innovation.

Today's companies need to move fast. The emphasis is on speed and agility. To enter new markets, rethink products, services, and categories, and offer exciting new integrated experiences, can't be an effort that moves at the speed of the multi-year development projects of a decade ago.

Companies need to deliver solutions quickly, make adjustments even faster to align with new business conditions, and continue improving and expanding their offerings and market footprint. That's hard to do if you're designing, developing, deploying, and maintaining significantly more APIs than you are reusing.

Replacing the heavyweight, three-layered approach with modern, lightweight API-led connectivity that offers direct access to the breadth of iPaaS functionality aligns well with the broader requirements needed to address digital transformation for today and tomorrow

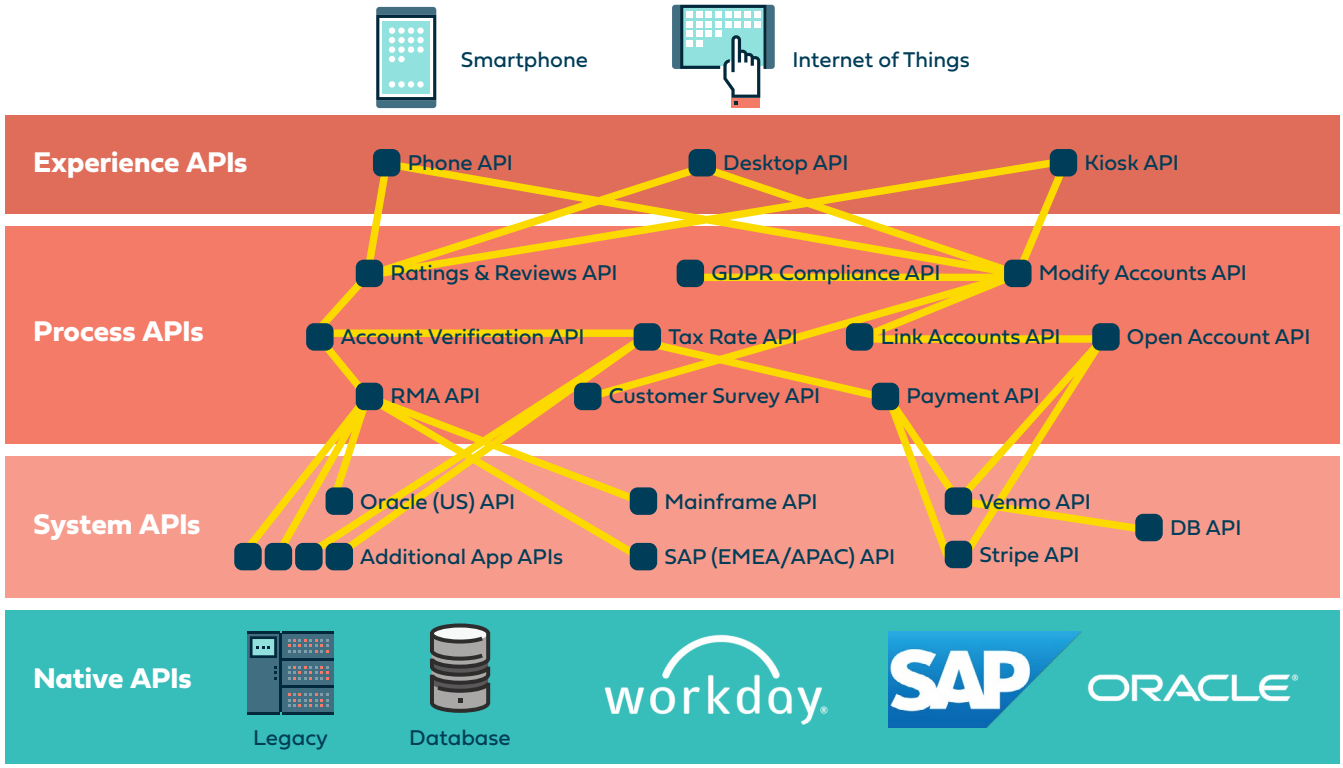


Figure 2 – The API-led "spaghetti diagram" across the API layers

AVOIDING THE "BRIDGE TO NOWHERE"

If a company discovers that fewer than 40 percent of its API components are being reused, it may reasonably question its investment in the other 60 percent.

How much of that time and money could been invested in development work to advance digital transformation initiatives faster? How much could have been faster with ready-to-use connectors from an integration platform?

These underutilized APIs end up as the software equivalent of the civil engineering phenomenon known as the "bridge to nowhere": a bridge that was built with the idea of carrying traffic to some destination, but was later abandoned and now guides intrepid travelers exactly nowhere (into thin air or into the face of a rugged mountain.)

Travel website Atlas Obscura lists eight physical "Bridges to Nowhere," including the popular "Bridge to Nowhere" hiking destination on Mount Baldy near Los Angeles, California, as well as bridges in Dunbar, Scotland and the Falkland Islands. Most of these bridges, like the one on Mount Baldy, began as part of a larger vision but were abandoned due to lack of use.

Companies investing in API components that see little or no reuse face a similar outcome. They've applied lots of engineering work to grand projects, but the vision behind that work will never be realized. And now the APIs sit idly by, like a bridge to nowhere.

A BETTER APPROACH: MODERN IPAAS

If companies that have adopted API-led connectivity have had cost overruns and project delays, how should organizations go about building the connections they need for digital transformation?

A unified iPaaS delivers a better path forward. Instead of starting with APIs, start with your business goals, and then modernize your infrastructure to fulfill those goals. APIs are absolutely a critical part of a successful integrated digital framework, but the business goals should come first.

One way to start with a business-led approach is to start with workflow automation embedded inside iPaaS. Workflow automation is one of the best ways to graphically visualize new business processes spanning people, applications, and bots, to translate business goals into integration processes. Business users with domain knowledge can collaborate more easily with developers to participate alongside citizen integrators, ad hoc integrators, and integration specialists, to develop integrations and workflow automation that deliver meaningful business results for the company's daily operations and strategic goals.

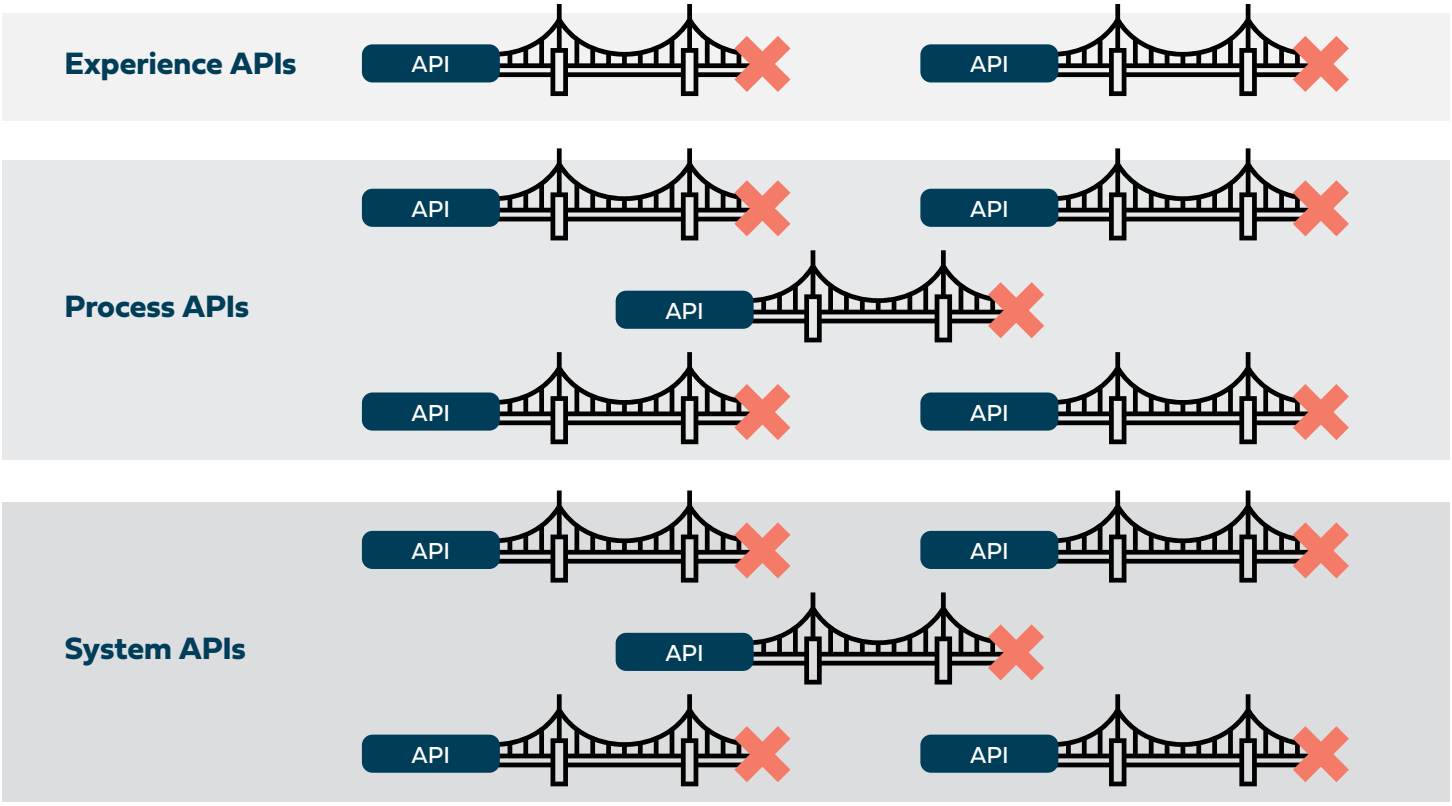


Figure 3 - In API-led connectivity, too many unused APIs are not reused, providing a maintenance burden for a bridge to nowhere.

Once your proof of concept workflow automations are built, you will likely find the need to API-enable some of those workflows, ensure the data can be enriched and trusted, connect the workflows into applications and databases, and perhaps share your data with trusted partners using Electronic Data Interchange (EDI) and other structured and unstructured partner collaboration standards and solutions.

This connectivity is a foundational principle of the Boomi AtomSphere Platform. Every component of an integration can be seamlessly connected as needed to any other component. The "transformation" part of digital transformation cannot be realized by any single integration pillar (integration, EDI, API management, workflow automation), but only by the usage of many of them — if not all — as a single solution. This unification of integration components is the foundation for delivering "Integrated Experiences" to your customers.

BOOMI ATOMSPHERE: IPAAS FOR INTEGRATED EXPERIENCES

A pioneer in the integration cloud, Boomi provides the solution to help customers deploy their integrated digital framework through a unified platform spanning B2B management, API design and management, workflow automation, data readiness, and app development to create faster, smarter, and more agile businesses.

Fast time to integrate and reusability are key aspects of a digital transformation strategy, and modern iPaaS provides the foundation. iPaaS doesn't start exclusively with APIs, and then follow later with other integration components further downstream.

The Boomi AtomSphere Platform embeds API design and management seamlessly into its core integration capabilities, including pre-built connectors to integrate with thousands of popular applications and data sources; the ability to support low-code app development, enabling integration developers and even tech-savvy business users to design and configure software components in a graphical user interface; and finally data catalog, data preparation, and master data management. And everything is part of a unified solution.

New users of Boomi AtomSphere commonly start their journey with the core Boomi Integration foundational component. As their digital transformation continues, they add additional components as needed to help them deliver integrated experiences for customers, partners, and employees.

> "**Instead of starting with APIs, start with your business goals,** and then modernize your infrastructure to fulfill those goals."

The six components of iPaaS integration within the Boomi AtomSphere Platform are described below:

INTEGRATION

- Use Boomi to connect apps and data with speed and ease.
- Break down data silos by integrating on-premises and cloud applications, data sources, and devices across your distributed hybrid environment.
- Build any integration with exceptional speed.
- Simplify your integration process and error resolution.
- Deploy prebuilt connectors to applications and databases.

MASTER DATA HUB

- Build, enrich, and synchronize trusted data across your company. Create a single source of truth with an easy to implement, flexible, and secure master data management service.
- Synchronize and reconcile disparate data sets.
- Simplify setup and configuration.
- Gain a 360-degree view across products, employees, and customers.

B2B/EDI MANAGEMENT

- Simplify how you manage your B2B/EDI trading partner network. Effectively integrate with all your vendors, suppliers, distributors and more.
- Support traditional, custom, and modern B2B/EDI standards through open technology.
- Track and manage integrations and

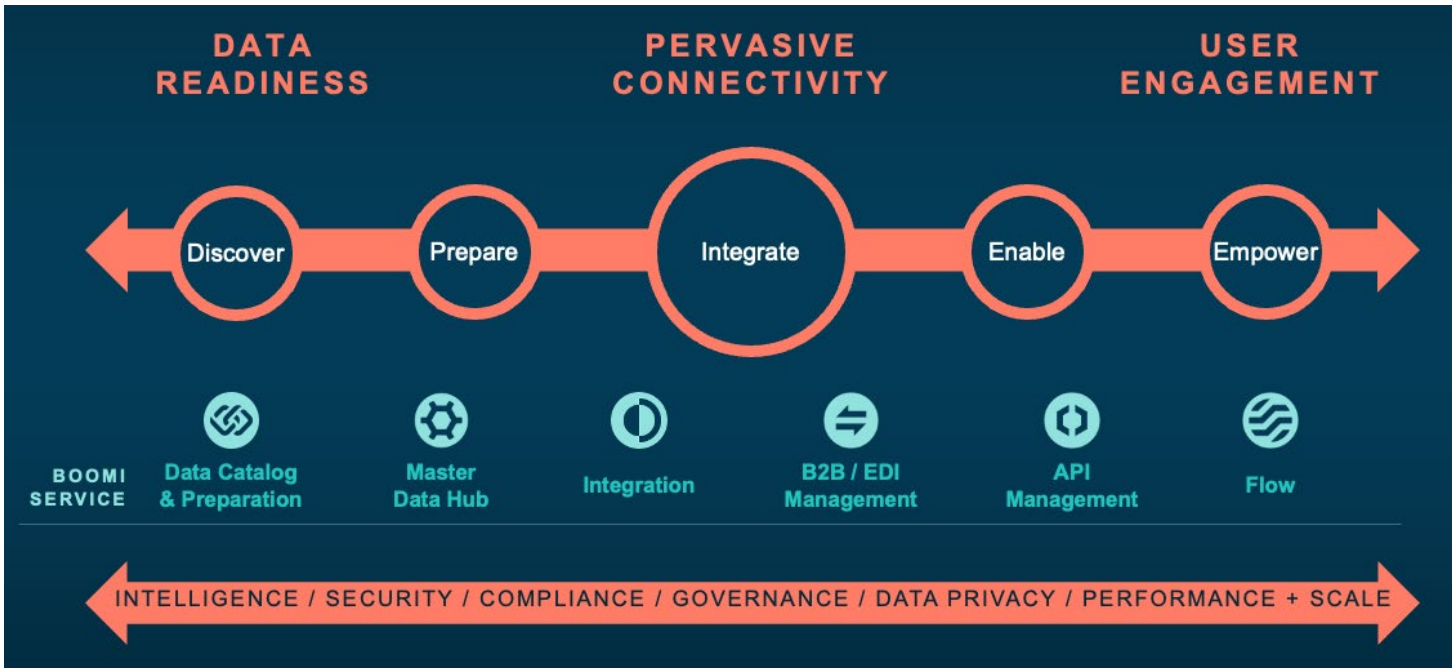


Figure 4 – Boomi AtomSphere integration platform as a service with seamless connectivity across the six integration components.

communications across the partner ecosystem.

- Reduce total cost of ownership (TCO) by consolidating multiple legacy products into a single platform.

API MANAGEMENT

- Design, secure, and scale APIs across your digital ecosystem with seamless access to application and data connectors, data management, and workflow automation using any integration pattern, including a simplified and modern API-led connectivity strategy.
- Build and publish any endpoint as an API.
- Create new applications with aggregated data.
- Control and govern policy and data access.

FLOW

- Build simple or sophisticated workflows to improve collaboration. Create customer journeys through a cloud-native application development service.
- Remove manual complexity from your business processes.
- Rapidly build and deploy responsive mobile applications without extensive coding.
- Enable cross-functional collaboration to improve user experience.

DATA CATALOG AND PREPARATION

- Discover the value of having trusted data in the right context at the right time that is connected across silos.
- Save time in exploration and data discovery.
- Get insights into relationships between different data sources in context.

BENEFITS OF THE BOOMI ATOMSPHERE PLATFORM

KEY BENEFITS OF BOOMI ATOMSPHERE INCLUDE:

- **Cloud-Native Platform With Automated Upgrades** - Boomi's single instance, multi-tenant platform provides all the benefits of the cloud, including flexibility, agility, design patterns, scalability, high availability, built-in redundancy, and automatic upgrades. All customers automatically benefit from the latest features and functionality.
- **Distributed and Multicloud Architecture** – The Boomi Atom is a lightweight runtime engine that allows integrations to be deployed wherever needed: in Boomi's Atom Cloud, in a public or private cloud, or on premises. Multiple Atoms can be clustered as a Boomi Molecule to provide a highly scalable, distributed processing runtime. Seamlessly connect your entire digital enterprise across on-premises and multicloud environments all the way to IoT and edge devices, as well as support exponentially growing data volumes, while ensuring low-latency and high-performance.
- **Low Code, Visual UI** - Boomi's drag-and-drop visual UI and low-code platform ensure the greatest speed and flexibility to support a wide range of projects – from the simple to the most complex. Most integrations can be handled via Boomi's out-of-the-box interface. For complex or specialized integration scenarios, Boomi offers advanced developer tools to ensure effective

> **A modern iPaaS addresses many of the shortcomings found in** traditional, three-tiered API-led connectivity approaches.

project delivery.

- **Enterprise Grade Security** - At Boomi, we build security into everything we do to protect data across all parties, giving customers peace of mind. Boomi's integration platform has achieved U.S. Federal Risk and Authorization Management Program (FedRAMP) Authorization.
- **Pervasive Intelligence** – Drawing from terabytes of anonymized metadata, Boomi provides suggestions and best practices to make every user more efficient and effective, including Boomi Suggest for automated data mapping, Boomi Filter Suggest for automated connector configuration, Boomi Resolve from contributions of an ecosystem of Boomi developers and architects, and Boomi Assure for crowdsourced regression testing.
- **Flexible and Low Footprint Runtime for APIs** - Leverage the Atom distribution technology to gain flexibility in deployment without getting locked into specific servers and cores for execution. APIs are backed by processes in Boomi and you can deploy as many processes as you need, without consuming any CPU. This leads to cost savings, as CPU is consumed only when the underlying processes are executed.

Many iPaaS solutions claim to have a "unified" platform. Boomi's approach to a unified platform is different from any other solution on the market. No other offering provides the seamless flow of data across what were previously disparate pillars of integration. The following examples describe the data flow between iPaaS pillars, explaining the benefit of Boomi's unified iPaaS offering and how Boomi uniquely delivers Integrated Experiences:

API MANAGEMENT BACKED BY DATA QUALITY. What good is an API if the data it is accessing is of questionable quality? With an integrated approach to iPaaS, APIs can be backed by Master Data Management to ensure that data is trusted data.

APPLICATION INTEGRATION AND DATA INTEGRATION – BREAKING DOWN THE BARRIER. Data integration and associated high volume batch database migration user experiences using Extract, Transfer, and Load (ETL) and other methodologies are often different from application integration styles that focus on real-time synchronization of applications. With Boomi's modern iPaaS, users can easily integrate both applications and data without learning two disparate user interfaces.

B2B/EDI WITH SEAMLESS ACCESS TO BACK-END ERP. Receiving data from a trading partner via EDI isn't of much use if it can't instantly be sent to your back-end ERP applications like SAP, Oracle, or NetSuite. With B2B/EDI embedded into iPaaS, data flows seamlessly from trading partners to and from your back-end ERP applications

WORKFLOW AUTOMATION WITH PRE-BUILT CONNECTIVITY TO CRM, HCM, ERP. Workflows between people for approval processes or exception management for Robotic Process Automation (RPA) bots can only provide high value if they have the ability to instantly connect to applications and other data sources. With an integrated iPaaS, workflow automation is available by default with all your integrated applications.

MASTER DATA MANAGEMENT WITH DIRECT ACCESS TO A DATA CATALOG. To provide a single source of truth, it's critical to ensure your MDM hub is pre-integrated with a data catalog that can discover all the relevant known and unknown data. When MDM is embedded into an iPaaS, you always have access to a data catalog to ensure you are capturing all data necessary.

API-ENABLE ANY INTEGRATION COMPONENT INSTANTLY. When some of the integration components are standalone and decoupled, it becomes additional work to API-enable a software asset such as a subprocess, integration, or data service. But when API

management is embedded in iPaaS, enabling these services for downstream use is a quick and easy process. As described above, a modern iPaaS addresses many of the shortcomings found in traditional, three-tiered API-led connectivity approaches. As we saw, some customers adopted an API-led connectivity strategy to take advantage of reusable components. But modern iPaaS supports reusability in more ways and more successfully than a heavyweight style of API-led connectivity. Let's now examine reuse in a modern iPaaS.

BENEFITS OF REUSE IN BOOMI IPAAS

The Boomi AtomSphere Platform embeds reusability into the design of a modular and component-based platform, eliminating overhead. Let's take a look at how reuse is embedded into the design in the three areas of connectors, mapping, and process automation.

CONNECTORS: HOW REUSABLE CONNECTORS SIMPLIFY.

Connectors are the solution to abstract away API complexity. Integrators no longer need to be experts in the nuances and complexities of all the various forms of APIs. Instead, pre-built connectors make it easy to connect applications, datastores, and technology.

There is one connector designed for Salesforce (REST), another for PeopleSoft (SOAP), another for Oracle HCM Cloud (Atom feed), and many more specifically designed for the most commonly-used applications. Likewise, there are a broad array of technology adapters that cover all other scenarios based on how data is exported or imported.

The first time you use a connector to integrate with NetSuite, for example, for a "customer data synchronization" use case with your Salesforce application, you are effectively making an instance of the connector known as a connection. As you create your next integration with NetSuite with a different use case, such as "opportunity to order," you can reuse the authentication from the first connection, reuse the connection URL (or other means to target the data source), and simply select the operation you wish (i.e., insert, update, etc.)

MAPPING: HOW MACHINE LEARNING EMPLOYS REUSE FOR FASTER INTEGRATION

Most iPaaS providers have made improvements to simplify the user interface for integration developers. While this is certainly helpful, it doesn't address the #1 challenge when integrating applications.

Every application has unique variable names and different data models for storing data. For example, a source application might use "company_name" as the attribute for a company name. The target application might have fields "cname", "company", "name", "cname1", "D&B_id", "customer_id", "company_id" or some other variation of the word "company" to label its field storing company names. To know which attribute in the target application is analogous to "company_name" takes some research.

That research becomes more difficult when the field is not as intuitive as "company name." For example, what does "sales_region" mean in the source application? Is there an analogous field in the target application? What if the source application tracks sales regions by zip code and the target application uses time zones?

How to "map" data (selecting which source data attributes should be sent to which target attributes), is often the primary roadblock to faster business connectivity. A single integration might require a few mappings, or it might require dozens.

The solution? Machine learning (ML).

But the solution requires much more than a machine learning algorithm.

There are two criteria that must be met for machine learning to deliver on simplifying integration mapping. The first is developing the ML algorithm that anonymously learns how end users are mapping specific attribute types between dissimilar applications. And the second is building up a massive library of real-world crowdsourced integrations that have been put into production by companies connecting their businesses. Without this volume of integrations to draw from, the ML mapping technology is of little to no value as the data sampling size needs to be large enough to provide statistically valid integration suggestions and guidance.

As the originator of machine learning for integration, Boomi has now amassed over 191,000,000 crowdsourced integrations. As a result of having a cloud-native, multi-tenant solution, Boomi can deploy these integrations to receive machine-learning-based guidance for faster time to execution.

WORKFLOW AUTOMATION: HOW REUSE INCREASES AGILITY

Workflow automation orchestrates the flow of data and the interaction of that data with people and bots for a business process.

For example, let's say a user fills out a form. The data from the form then flows to a database to determine if

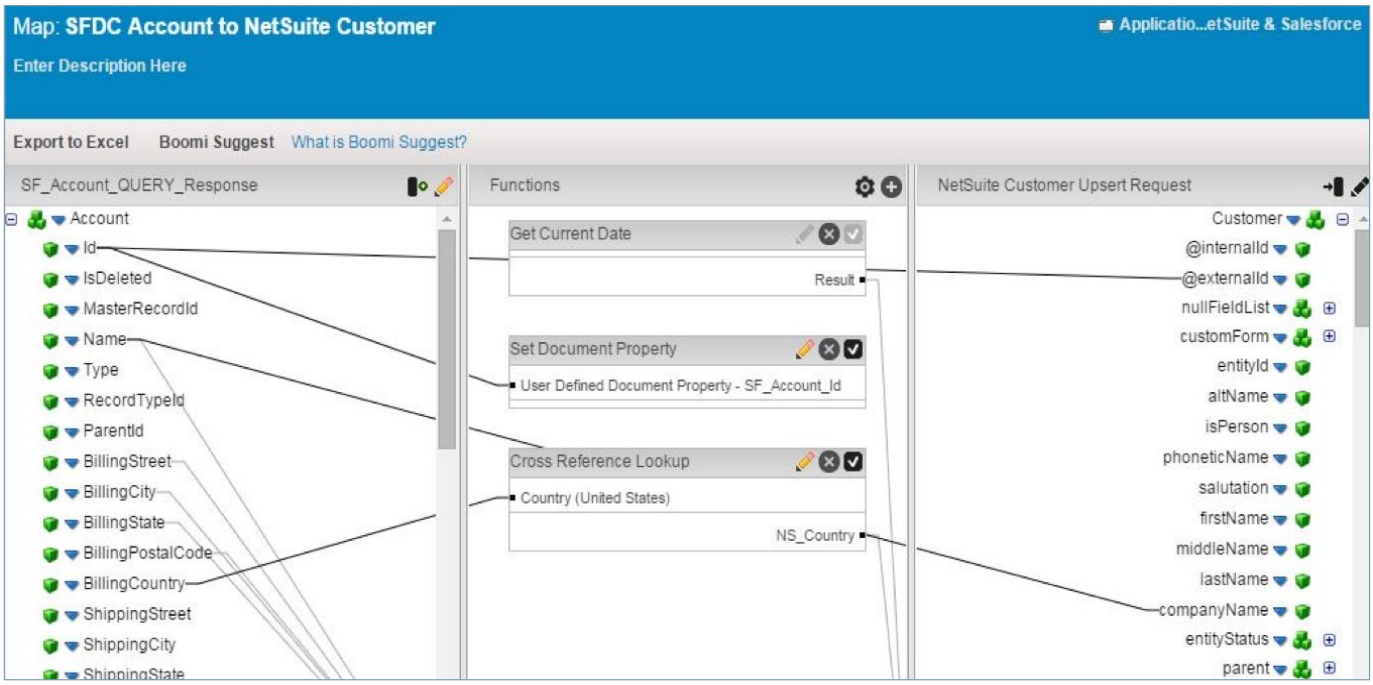


Figure 5: Automated mapping of data from Salesforce to NetSuite using Boomi Suggest. Machine Learning knows that "Name", which might appear as though it could map to many other name-related attributes in NetSuite, actually maps to "companyName"

this customer exists. Next the data enters an enterprise application such as ServiceNow or NetSuite or Oracle E-Business Suite. The data might get enriched by calling an API to add the postal code (i.e., zip code in the US). Once the data is enriched, it's stored in the database, and a confirmation is sent back to the user.

As you might expect, many other processes might need to reuse the functionality built into this process. In the example below, looking up if a customer already exists and if so, inserting the data into a database or application, might be reused for customer self-service, internal customer support, new sales orders, deleting a customer record as part of a GDPR request, and more. Instead of rebuilding these services for every use case, subprocesses are specifically designed for reuse, so you build them once, and then reuse them as often as needed. Ensuring every process you build is immediately reusable as a subprocess or API call without any added upfront investment of time and cost is a built-in feature of the Boomi AtomSphere Platform.

API MANAGEMENT: HOW IPAAS-EMBEDDED API MANAGEMENT DELIVERS REUSE AND ACCESS

Many organizations are on a journey to improve interactions with their customers, partners, and lines of business. And APIs are essential for driving digital transformation, allowing for rapid adoption of applications to provide new functionality and a seamless experience across any channel.

Too often, however, API management has been treated as a standalone feature, adjacent to application integration but not part of a comprehensive iPaaS. As stated above, APIs need the abilities to seamlessly check for data quality with MDM, access a data catalog for easy access to data, rapidly layer on top of other integration components such as processes for reuse, and be used side-by-side with EDI as more companies migrate their B2B to a hybrid API/EDI solution.

With Boomi API Management, your enterprise can gain full control of its APIs and manage a unified strategy that aligns your API needs with your integration processes. APIs are easily consumable and reusable, and businesses are increasingly relying on APIs for application development efforts. Boomi allows an enterprise architect (API producer) to configure and expose real-time integrations via APIs and API proxies to make data readily available for internal and external use.

With a growing number of applications, the need to manage and govern APIs becomes crucial for the business. With the API gateway in Boomi API Management, the technical team can effortlessly publish and govern APIs while managing data access, whether it's on premises, in the cloud, or at the edge.

Composite applications help businesses provide an omnichannel customer experience. An application developer (API consumer) can easily discover and access data from existing applications and test inside Boomi's API Developer Portal, to create integrated experiences across mobile, social, and IoT networks.

Boomi offers powerful API lifecycle management features as well as other approaches to integration and workflow automation. Boomi also gives companies the

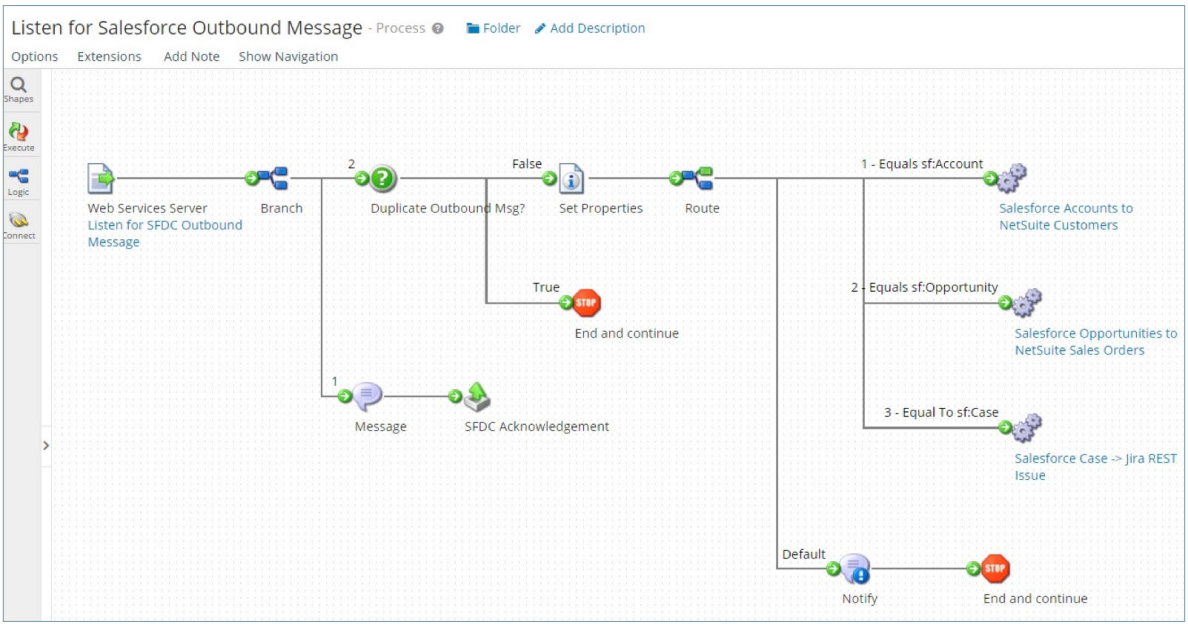


Figure 6: Boomi AtomSphere process automation supports subprocesses (gear icons) to enable reuse for every future occurrence

freedom and flexibility to choose the design pattern that best suits a particular business use case. That use case might call for both APIs and EDI. Or it might simply call for ready-to-use connectors or integrations built quickly and easily in a low-code environment.

SUMMARY ON REUSABILITY

The Boomi AtomSphere Platform supports reusability in connectors, mapping, process automation, and API management, and it supports reusability in other ways, as well. You can select a prebuilt integration template from the Boomi Discover (discover.boomi.com) library or quickly build a template yourself with the help of prebuilt connectors and ML. From that point on, every new integration can access and deploy all your existing integration components.

The table below highlights how Boomi AtomSphere has redefined how to achieve reusability in an iPaaS.

COMPONENT	HOW ATOMSPHERE REUSABILITY WORKS
Reusable APIs	Each API endpoint configured in an API service component has an independently deployed linked process for reuse. No need for additional overhead development.
Reusable Processes	All Boomi AtomSphere processes are stored independently to ensure availability for future process usage and are callable as APIs.
Reusable Connections	Because both connections and operations are reusable components, you can, for example, create a single connection and pair it with different operations and reuse it for every future integration that connects to that application.
Reusable Maps	Maps that provide the data transformation between a source and target endpoint can be designed so they address specific functions that will likely be reused in the future to eliminate recreation of existing functionality.
Reusable Profiles	Profiles eliminate the need to redefine a file format for describing field names, delimiters, column positions, data types and more. Profiles in AtomSphere are designed to be reused everywhere else you use that similar file format so there is no need to redefine the layout.
Reusable Cross-reference Tables	Import or build once and leverage for every future integration (i.e. AL as a cross reference for Alabama, AR for Arkansas, etc.)
Reusable Map Functions	In addition to standard map functions (i.e. mathematical), your user-defined map functions are saved as standalone components for reuse in multiple maps.
Reusable Process Routes	Process routes enable you to execute another process from within a process dynamically, based on a reference that is set at run time. The subprocesses and the process route itself can all be changed and deployed independently of the parent process.
Reusable Trading Partner Profiles	Reuse common EDI components to eliminate duplicate entry for similar partner configurations.
Reusable Error Handling	Utilize common reusable processes as sub-processes in your design for functions such as error handling (e.g. into ServiceNow, queues, logs).

BOOMI CUSTOMER SUCCESS STORIES

Using the Boomi AtomSphere Platform and its flexible approach to APIs and integration, customers have achieved reuse and faster time to value with impressive results. Here are some examples:

CASE STUDY: CORNELL UNIVERSITY

Cornell University, an Ivy League university with over 23,000 students, prioritizes public engagement to help improve the quality of life for New York, the nation, and the world. To modernize its administrative, academic, and IT functions, the university launched a business initiative to connect cloud apps and legacy systems swiftly and easily.

Cornell Information Technologies (CIT) group estimated that it would take months to build a single integration with its existing integration solution, and it would also increase troubleshooting and maintenance costs. Additional shortcomings in stability, runtime speed, reusability, and visibility into the status of integrations made modernization a pressing need.

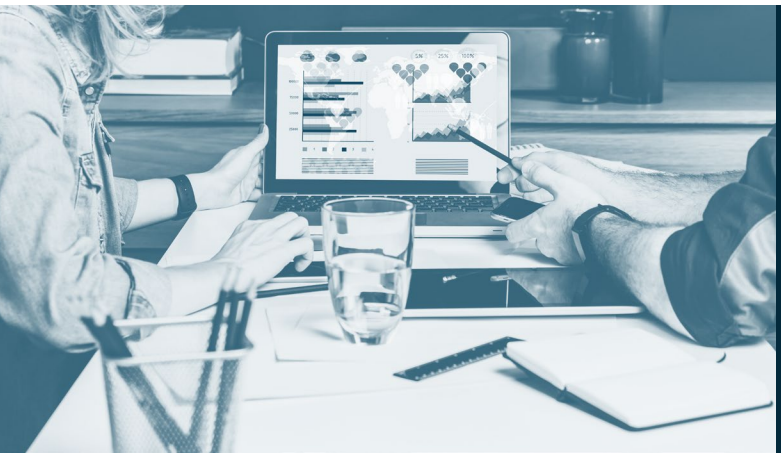
The CIT group evaluated Boomi and another leading vendor for moving integration to the cloud. John Parker, Lead Software Engineer & Integration Architect at Cornell, says the contrast was clear: Boomi was faster and easier to use.

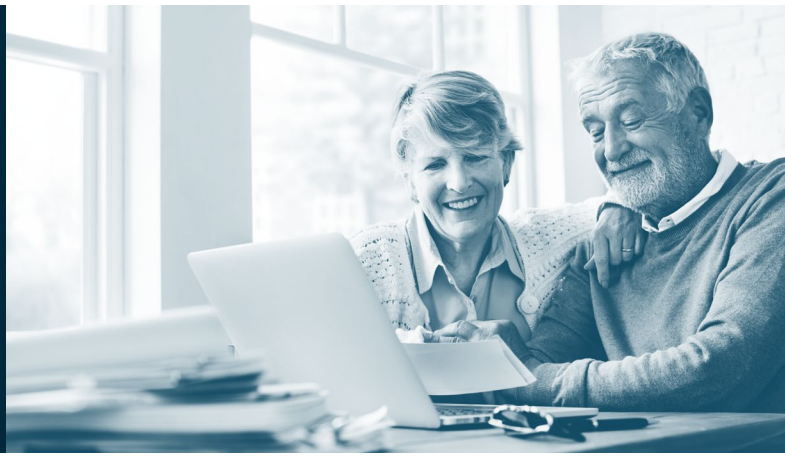
Boomi also provided a comprehensive set of capabilities for addressing the full array of integrations needed for running a hybrid IT environment, Parker adds. "We looked at Boomi and thought, 'This is too simple — how can you create complex integrations with something that's this easy to use?'" he says. "Even with no training, we were soon rolling out integrations in days with Boomi that took months and months of development time using our previous platform."

Cornell started with a business-led approach focusing on administrative and academic modernization for speed and reusability. The university chose to deploy application and data integration first. Once they had a strong integration foundation in place, Cornell IT staff architected Boomi's API design and management tool to unlock data from legacy applications and support a modern cloud and mobile environment.

Their approach shows the benefit of having a broad portfolio of iPaaS components to address the breadth of requirements needed for digital transformation.

"Boomi's private Atom Cloud architecture, in conjunction with all the other tools in their suite, has helped us greatly accelerate our move to cloud-based, best-of-breed applications with a much more streamlined and simple upgrade path," Parker says. "Boomi is now a cornerstone of our ongoing transformation into a more connected digital campus."





CASE STUDY: NATURAL INTELLIGENCE

Natural Intelligence, a global leader in multi-vertical online comparison marketplaces, is another company that has benefitted from switching to Boomi. The company's implementation illustrates the benefits of combining multiple integration pillars into a single solution spanning API management, application integration, workflow automation (Flow) and more to deliver Integrated Experiences for its customers.

To power its marketplace, Natural Intelligence connects to the IT systems of the brands being compared, tracks revenue on those remote systems, and then brings data into its own data lake. As the company has more than 600 partner brands, each with its own data language, it was difficult to harmonize the flow of data.

The low-code Boomi AtomSphere Platform manages Natural Intelligence's API funnel with the company's partner brands. With Boomi, the company has gained visibility into the API flow as well as increased control.

Natural Intelligence has also learned best practices in terms of managing release versions. With Boomi, it has become capable of reacting with speed and stability, so it can better service its customers.

In addition, Boomi Flow has helped Natural Intelligence to build complex processes quickly and with flexibility.

Since working with Boomi, Natural Intelligence has realized significant benefits, including:

- The ability to fix problems on demand, giving users more independence and freeing up time and resources to support business scalability
- Heightened visibility into internal performance issues and the ability to respond more rapidly as they arise
- Faster delivery of data to customers — what used to take weeks now takes just hours
- The stability needed to run 2+ million transactions per day

CASE STUDY: HESTA

Another company, HESTA, a retirement (superannuation) fund for the healthcare and community services sector in Australia, switched to the Boomi iPaaS after having spent years building point-to-point integrations.

Those point-to-point integrations were time-consuming to build and difficult to maintain. Ultimately, they slowed down the company's efforts to build services that delivered positive experiences to customers. And they thwarted the company's ability to achieve even greater efficiency, which in turn could help generate better returns for its members.

Boomi integration has eliminated the need for HESTA employees to manually copy and move data, saving the company 55 hours of manual work per month. Employees now can spend that time more productively, engaging directly with customers.

In addition, HESTA has been able to build integrations with partners, which has led to improved customer satisfaction and higher growth. For example, an integration with an insurer led to an improved online experience that triggered a 73 percent increase in online insurance activities.

"Our partnership with Boomi is not just about the technology, it's about how we can all grow and learn together to actually focus on delivering real outcomes for our members" says Sheena Peeters, general manager – technology at HESTA.

These examples show the advantage of taking a business-led approach to connectivity. Using Boomi, these innovative companies have built the APIs and other connections they need to accelerate business growth, while avoiding the high costs and lengthy development cycles of a heavyweight API-led design model.

CONCLUSION

There's a critical success factor for digital transformation projects: having an integrated digital framework foundation in place to connect people, data, and applications. Once this digital framework foundation is built and operational, IT organizations can create digital transformation projects featuring new, integrated experiences that deliver value to customers, partners, and employees.

Lightweight API-led connectivity can fulfill the need for this foundation. But as we've seen from customer surveys and case studies, building this foundation with an overemphasis on APIs layers can be expensive, time-consuming, and inefficient, producing services that end up being little used. Pressed for time and working with limited budgets, companies can't afford to invest in complex and costly API-led connectivity that doesn't justify the time and budget that went into creating it.

In contrast, the integrated design of Boomi iPaaS addresses the challenges of cost and complexity as well as providing faster time to value. The modular AtomSphere iPaaS automatically embeds reusability into the design of new components, reducing development overhead and improving return on investment (ROI). Companies can now modernize from heavyweight, multi-layer API methodologies into modern, lightweight API-led connectivity quickly and easily, and leave the maintenance burden, latency, and security issues of those added API layers behind.

Furthermore, Boomi API Management has the added advantage of automatically being able to leverage the other capabilities of iPaaS, such as data discovery, data management, EDI, and workflow automation.

Offering low-code development, ML-guided integration, and component reuse out of the box, Boomi's unified and modern iPaaS, the Boomi AtomSphere Platform, delivers integrated experiences and faster time to value for customers, employees, and partners.

To learn more about the Boomi AtomSphere Platform, see https://boomi.com/platform, or contact a Boomi integration specialist today at https://boomi.com/contact/.

*Gartner, "Ensure Your Integration Strategy Supports Modern Integration Trends," Abhishek Singh and Eric Thoo, February 23, 2021

Learn more about how Boomi's unified platform can help you connect everything.
boomi.com/platform

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