# Innovation Insight for Hybrid Integration Platforms

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The hybrid integration platform is rapidly becoming the capability framework of choice in the design of modern integration infrastructure. Application leaders responsible for integration should strategically pursue a HIP-inspired vision, but tactically select the proper technical building blocks.

## Key Findings

- The hybrid integration platform (HIP) is increasingly becoming the reference capability framework for organizations reshaping their integration platform strategy to tackle the pervasive integration requirements stemming from digital transformation initiatives.

- Most organizations plan to implement HIP-inspired infrastructure by rationalizing and extending their current integration platform software, such as ESBs or data integration tools, with new components, including integration PaaS (iPaaS), API management platforms, event brokers, metadata management and other tools.

- A market for "out of the box" HIP-enabling offerings is developing, but the provider landscape is very fragmented. The maturity of the rapidly evolving technologies may not be consistent across offerings' components. More and more integration features come embedded in broader offerings like SaaS, packaged business applications and PaaS from large and small providers.

## Recommendations

Application leaders responsible for modernizing integration strategies and infrastructure should:

- Respond to the growing demand for integration stemming from digital business initiatives by delivering a HIP-inspired infrastructure over the next three years. When supported by proper governance capabilities, a HIP will help scale up their integration capacity (and agility) by involving in the delivery strategy both developers and business users to complement their integration specialists.

- Prevent upfront overinvestment by implementing their HIP plan in incremental steps, each justified within business-critical initiatives (such as post-modern ERP, customer engagement,

the digital workplace, supply chain management, the API economy, Industry 4.0 and ecosystems enablement).

*gates Schlegmod*

- Avoid the risks of excessive vendor lock-in by taking a highly pragmatic, open-minded and — where sensible — short-term approach to selecting HIP building blocks. They should assume they might have to replace some of these components as their requirements evolve and the HIP technology market matures and consolidates.

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## Strategic Planning Assumption

By 2022, at least 65% of large and global organizations will have implemented a hybrid integration platform.

## Analysis

Application leaders in charge of integration are under pressure to reshape their integration platform strategy in order to tackle the new "pervasive" integration challenges stemming from organizations' desire to establish their digital platforms. Those surely include technology-driven issues, such as supporting integration in the context of cloud, mobile, IoT, microservices/serverless, analytics, and artificial intelligence/machine learning architectures. Most importantly, integration plays a critical role in business-critical initiatives (such as the API economy, ecosystems, post-modern ERP, digital customer experience, supply chain management, Industry 4.0 and the digital workplace).

The hybrid integration platform (HIP) is rapidly becoming the reference capability framework for the next-generation integration infrastructure aimed at enabling organizations to address pervasive integration requirements. The HIP focuses on supporting a wide range of integration use cases based on a do-it-yourself approach. This implies an active involvement of multiple constituencies and organizational entities, proactively supported by an Integration Strategy Empowerment Team (ISET) (see "Integration Strategies for the Digital Era Require New Delivery Models").

This research will help application leaders responsible for modernizing their organization's integration strategy and infrastructure to plan their HIP strategy, taking into account both well-established and emerging technologies and use cases.

## Definition

The hybrid integration platform (HIP) is a framework of on-premises and cloud-based integration and governance capabilities that enables differently skilled personas (integration specialists and nonspecialists) to support a wide range of integration use cases. An organization's HIP is usually implemented by assembling a variety of technology building blocks, from one or more providers, which are managed as a cohesive, federated and integrated whole. A central team (typically an ISET, among its other responsibilities) is usually in charge of the HIP design, implementation and ongoing management.

## Description

Digital business transformation mandates organizations to rapidly integrate cloud, on-premises, and mobile applications and data sources, IoT devices, ecosystem partners, and social and business networks.

You cannot successfully address the growing number of pervasive integration tasks by using predigital era architectures, paradigms and technologies.
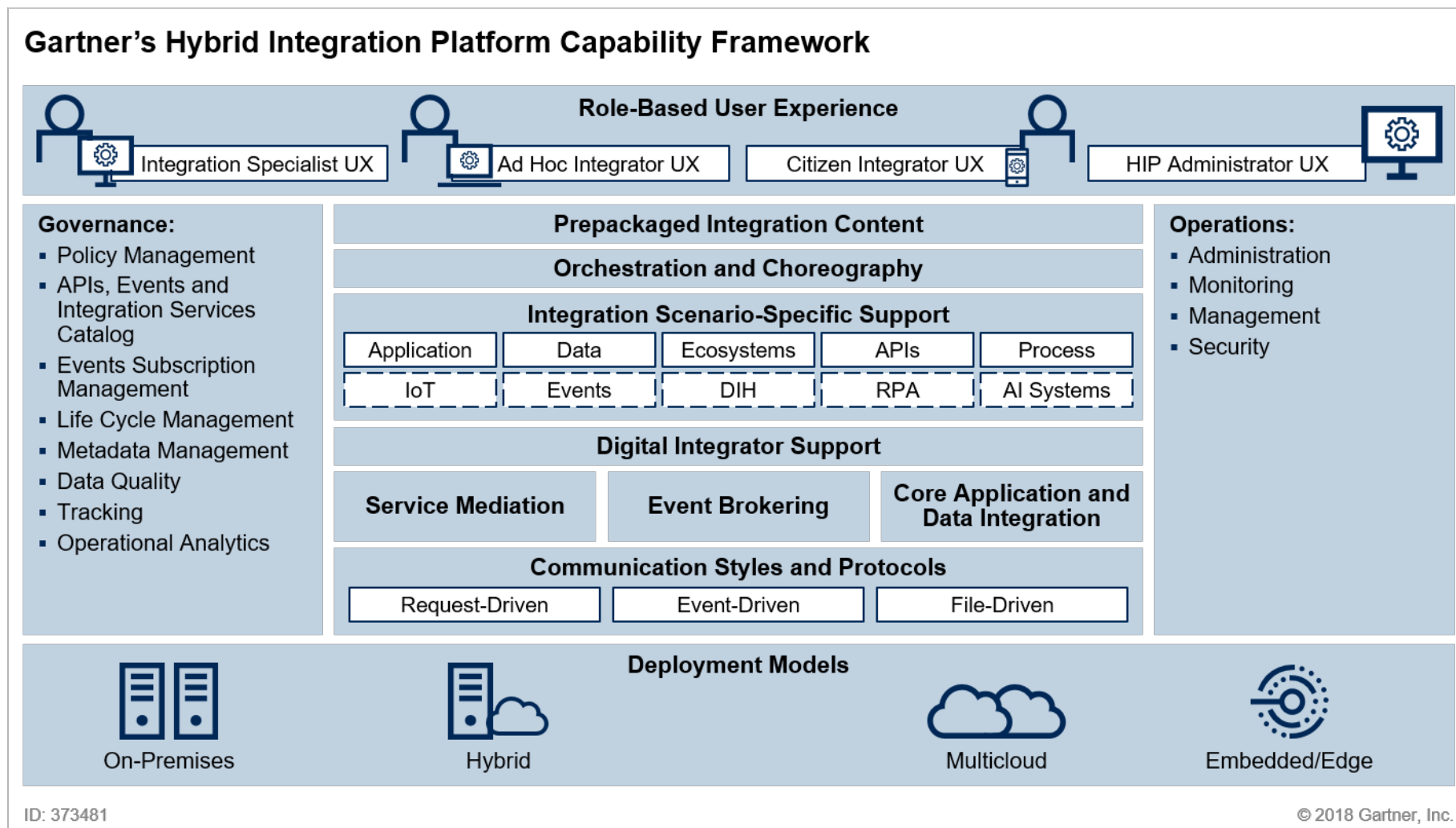
Gartner research findings indicate that an integration platform capable of tackling these challenges with the necessary agility, short time to value and adaptability must be able to support:

- **Different users:** These include integration specialists, line-of-business (LOB) developers, SaaS administrators and IT skilled personnel who occasionally perform integration tasks (the so-called *ad hoc* integrators), as well as business users (citizen integrators). Ideally, these constituents (or personas) should have access, in a self-service manner, to the platform capabilities appropriate for their profiles (see "Integration Personas and Their Impact on Integration Platform Strategy").

- **Connectivity to a wide range of endpoints:** Cloud, on-premises, mobile and IoT.

- **A variety of:**

  - Integration patterns:

    - Application

    - Data

    - B2B

    - Process integration

  - Use cases:

    - Integration of IoT, mobile, cloud, on-premises application and data

    - Event streaming

    - Artificial intelligence-based systems (such as VPAs, chatbots and machine learning platforms)

    - Robotic process automation

    - The digital integration hub

- **Cloud, on-premises and hybrid (cloud and on-premises) deployments:** These may also include capabilities embedded in other products and services and in edge devices.

We consider an integration platform with such characteristics as a HIP. Each organization must define and implement its own HIP to respond to its unique business and technical challenges. To help application leaders design their own HIP, Gartner has defined a general-purpose capability framework (see Figure 1), which they can use as a reference (for a detailed explanation of the individual functional categories, see Note 1).

Figure 1. A Schematic View of Gartner's HIP Capability Framework

**Gartner's Hybrid Integration Platform Capability Framework**

**Role-Based User Experience**

Integration Specialist UX | Ad Hoc Integrator UX | Citizen Integrator UX | HIP Administrator UX

**Governance:**
- Policy Management
- APIs, Events and Integration Services Catalog
- Events Subscription Management
- Life Cycle Management
- Metadata Management
- Data Quality
- Tracking
- Operational Analytics

**Prepackaged Integration Content**

**Orchestration and Choreography**

**Integration Scenario-Specific Support**

| Application | Data | Ecosystems | APIs | Process |
|---|---|---|---|---|
| IoT | Events | DIH | RPA | AI Systems |

**Digital Integrator Support**

**Service Mediation** | **Event Brokering** | **Core Application and Data Integration**

**Communication Styles and Protocols**

Request-Driven | Event-Driven | File-Driven

**Operations:**
- Administration
- Monitoring
- Management
- Security

**Deployment Models**

On-Premises | Hybrid | Multicloud | Embedded/Edge
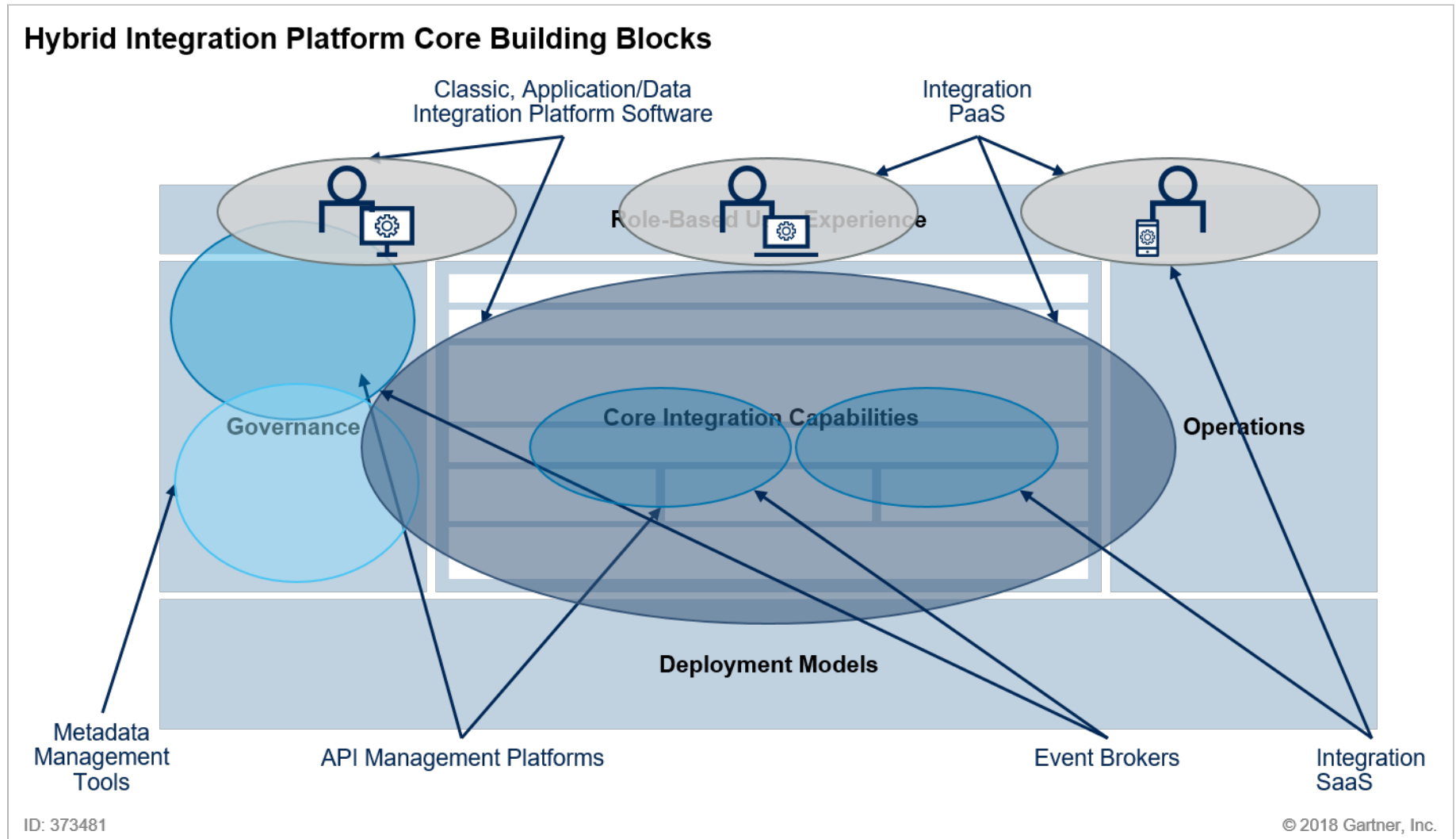
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AI = artificial intelligence; API = application programming interface; DIH = Digital Integration Hub; HIP = hybrid integration platform; IoT = Internet of Things; RPA = robotic process automation; UX = user experience

Source: Gartner (October 2018)

Gartner's HIP Capability Framework categorizes the functionalities of an "ideal" comprehensive HIP. Not every organization will need all these capabilities, but most — small, midsize and large, in almost every industry and country — will have to implement some during the next five years.

In most cases, the implementation of a HIP-inspired infrastructure requires the aggregation of multiple technologies. These include classic application and data integration software, iPaaS, API management platforms and increasingly also event brokers, metadata management tools and iSaaS (see Figure 2).

Figure 2. HIP Core Building Blocks



**Hybrid Integration Platform Core Building Blocks**

Classic, Application/Data Integration Platform Software

Integration PaaS

Role-Based User Experience

Governance

Core Integration Capabilities

Operations

Deployment Models

Metadata Management Tools

API Management Platforms

Event Brokers

Integration SaaS

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Source: Gartner (October 2018)

However, depending on your organization's requirements, you may also incorporate other building blocks (such as multiexperience development platforms, stream analytics platforms, IoT platforms or integration brokerage services) to support specific use cases.

A key aspect of Gartner's definition of a HIP is that it is managed as a whole, with responsibility for it being well-defined and typically assigned to an ISET. Therefore, the ultimate goal of the ISET is to make available to the organization an "integration business utility" shared service, including a HIP implementation and associated support services (for example, training, mentoring, consulting and help desk), also delivered by the ISET, which different integration personas can consume in a self-service fashion.

HIP implementation strategies may vary. Some organizations will just loosely aggregate multiple integration platforms, possibly from different vendors. Others will strive to implement a consistent and cohesive set of integration capabilities, typically from the same provider, by using common development, life cycle management, metadata management, governance and operation tools (see "How to Implement a Truly Hybrid Integration Platform").

The HIP's scope and governance may also vary. Some organizations will implement an enterprisewide HIP shared across one or more integration delivery and managed by a single ISET. Others will implement multiple federated HIPs, each serving a specific application domain, organizational entity (for example, a business unit or subsidiary) or geographic area. These unit-level HIPs will have to be managed by multiple federated, or at least coordinated, ISETs.

## Benefits and Uses

For user organizations embarking on the process of implementing a HIP, the ultimate goal is to provide a common, centrally managed and governed integration infrastructure that can be used, in a self-service fashion, by multiple constituents to address enterprisewide, LOB, departmental, project-specific and even personal integration needs.

The key benefits of a HIP are:

- **Support for a variety of integration scenarios.** These include application, data, B2B, mobile, cloud and IoT integration — scenarios that are usually addressed with specific tools. For example, organizations would traditionally use a data integration tool, an enterprise service bus (ESB) for application integration, a B2B gateway for B2B integration, an iPaaS for cloud service integration and an API management platform to support API-based mobile app integration.

  The reality of digital business is that you may need to address more than one of these scenarios in the same project. A platform capable of targeting all or most of them will reduce your costs and speed up integration projects' delivery (see "Converging Data and Application Integration: A Step Toward Pervasive Integration Using a Hybrid Integration Platform").

- **A flexible deployment model.** The HIP's ability to support on-premises, cloud, hybrid, edge and embedded deployment gives you maximal flexibility and optimization. For example, when implementing cloud-to-cloud integration use cases, you can use the HIP's cloud-based integration capabilities. To support ground-to-ground integration, you can use its on-premises capabilities. For complex ground-to-cloud-to-mobile use cases, you can use a combination of

the on-premises and cloud-based capabilities. This flexibility can be achieved by mixing user-managed integration platform software (for example, ESBs or data integration tools) and vendor-managed integration platform capabilities provided "as a service" (for example, iPaaS or API management platforms), depending on project-specific requirements (see "How to Architect a Multicloud-Capable Hybrid Integration Platform").

- **A tailored, self-service user experience (UX).** Gartner's HIP Capability Framework postulates that integration capabilities should be made available via differentiated UXs:

  - A very detailed, **high-control UX** for integration specialists, including APIs for automation and a command line interface (CLI).

  - A less powerful, **high-productivity-oriented, low code/no code UX** for ad hoc integrators (such as LOB developers and SaaS administrators) who occasionally need to perform project-specific integration tasks, and may also need to use the automation APIs and the CLI.

  - A **task-automation-oriented UX** for citizen integrators, which may become a feature of their digital workplace.

  This differentiation gives integration specialists an opportunity to use the UX that is most suitable for a specific project. More importantly, it enables you to delegate responsibility for integration tasks to ad hoc and citizen integrators, when appropriate.

  Ideally, all these different constituents should be able to access the HIP's capabilities through the UX that suits their roles, skills and profile, in a completely self-service manner.

- **Centralized governance and control.** If your HIP is implemented as a common, shared infrastructure (part of an integration business utility shared service), you have an opportunity to centrally:

  - Govern and control the activity of the different classes of user.

  - Define and enforce security and compliance policies.

  - Provide the users with reusable integration templates tailored to the different personas you must support.

  - Track the integration activity performed by users.

  - Collect data about platform utilization and endpoint access that you can use for capacity planning, cost allocation, budgeting, auditing and other purposes.

  Ultimately, you can gain a holistic perspective on the integration work that the different integration constituents carry out in your organization, which you can then use for optimization and planning.

- **An incremental approach to implementation.** You can implement your HIP by gradually adding, to the already in-place integration platform software, new components on a project-by-project basis. This will help you reduce implementation risks and make cost justification easier than if you took a "big bang" approach (although in some cases a big bang implementation may

be required for business reasons, for example, to support a merger). As this incremental process progresses, you may also have an opportunity to increasingly rationalize your portfolio of HIP components by reducing technology overlap (for example, at times an iPaaS could completely replace your in-place ESB, data integration tool or B2B gateway software).

## Adoption Rate

Gartner introduced the notion of the HIP back in 2014 (see "Why There's a Move Toward Hybrid Integration Platforms") and first formalized the Gartner HIP Capability Framework in 2016 (see "How to Implement a Hybrid Integration Platform to Tackle Pervasive Integration"). During this time, we have collected a growing number of examples of global, large and midsize organizations that have implemented — or are in the process of implementing — integration infrastructures that map to the HIP Capability Framework. Moreover, many global and local system integrators have tailored consulting and professional services offerings aimed to support organizations that want to reshape their integration platform strategy along the lines of a HIP capability framework.

Although many organizations already have a proto-HIP in the form of some ungoverned, and often redundant, combination of on-premises and cloud-based integration and governance tools, probably no more than 10% to 15% of organizations already have managed, HIP-inspired infrastructures in place. However, we predict that, by 2022, at least 65% of large and global organizations will have deployed a HIP-inspired infrastructure, whether as "greenfield" initiatives or as extensions of the classic integration infrastructures already in place.

Drivers for this rapid adoption will include digital transformation initiatives, the shifting of application portfolios' "center of gravity" to the cloud, the growing number of IoT projects and strategic initiatives (such as the API economy, digital business platforms, ecosystems, post-modern ERP, customer engagement, supply chain management, Industry 4.0 and the digital workplace).

## Risks

When implementing a HIP, application leaders responsible for integration may face the following issues:

- **Technological immaturity.** Several vendors provide many, if not all, the capabilities shown in the HIP Capability Framework. However, they often deliver them through multiple products of differing degrees of maturity, and not necessarily atop a coherent technological foundation.

- **Requirement for some assembly work.** Most organizations, and especially large and global ones, will not implement their HIP from scratch. Usually, the first step is to rationalize and aggregate their current integration infrastructure (such as ESBs, data integration tools and B2B gateway software). Then they progressively add new building blocks (such as iPaaS, event brokers, metadata management tools and API management). They often source these additional building blocks from vendors other than their incumbents.

  If you desire consistent development, deployment and operations across the components of your HIP, you will have to undertake significant engineering work to aggregate and homogenize

**them**. However, you can minimize such efforts by adopting HIP building block products that provide APIs to aid automation and customization.

- **Technological volatility and fragmentation.** A market for out of the box HIP-enabling integration offerings is developing, but the provider landscape is extremely fragmented and technologies are still evolving rapidly. Some of the building-block markets (such the iPaaS segment) are overcrowded and poised for consolidation over the next three to five years. Therefore, some of the build blocks that you acquire today, may need to be replaced in the non-too distant future.

  Moreover, an increasing number of integration features come embedded in broader products and services (for example, packaged and SaaS applications, multiexperience development platforms, IoT platforms and gateways, business process management platform as a service [bpmPaaS] and BPM tools, and analytics platforms). This makes it harder to pursue consistency and centralized control of your integration infrastructure.

- **Delivery model transformation.** To deploy a HIP successfully, you need to support it through an empowerment-oriented delivery model driven by an ISET or, especially in large organizations, perhaps multiple federated ISETs. Some organizations, however, are finding that setting up such a delivery model is the most problematic aspect of a HIP initiative in terms of change management. Most established integration competency centers have an "integration factory" attitude, and it may be difficult for them to transition to a "service provider" mindset.

- **Skills and best practices availability.** Finding HIP implementation and management skills is difficult, as they are still rare and expensive, industry best practices are not fully formed and documented, and external service providers' experience is still relatively limited.

## Evaluation Factors

### Selection Guidelines

As you select the building blocks of your HIP, we suggest following these guidelines:

- **Take a best-of-breed approach.** There are potential benefits to procuring all the component parts of your HIP from the same provider: economies of scale, simpler vendor management, technical consistency and commonality of tools. However, in many cases, these benefits are just theoretical, as providers' building-block offerings are still of uneven maturity and may have been developed on different technological underpinnings (for example, because some products derive from acquisitions). This is not always the case, as some providers have developed their HIP building blocks according to a coherent architecture, but, in principle, at this stage in the market's development, it is more realistic to adopt a best-of-breed approach. However, give preference to providers that enable open extensibility of their technology components via APIs or events, open standards support, use of open source technologies or other means.

- **Beware of "HIP-washing."** Many vendors have collected several HIP building blocks for opportunistic commercial reasons, not because they have internalized and articulated a HIP vision. "HIP-washing," by collecting discrete products that have little in common and labelling

them collectively as a HIP, is relatively easy. Favor providers that have a strategic, long-term commitment to the HIP concept and that can share with you relevant roadmaps and plans.

- **Be tactical.** Select your HIP building blocks by focusing on your short- and midterm requirements, on the assumption that you may have to replace some of them over the next three to five years. This market is still volatile and many products and providers are of dubious viability. You should try to avoid quick fixes via throwaway technologies. However, favor building blocks with a proven track record or that deliver innovative capabilities, even if they come from small, pure-play providers. In any case, favor providers that exhibit openness and extensibility of their products.

- **Be focused.** To avoid the duplication of skills and lack-of-agility risks, select your HIP building blocks strictly for the core capabilities you need for your HIP. Do not consider additional "value-added" features that overlap with the capabilities of other building blocks (for example, your selected iPaaS might provide some API management capabilities that overlap with your API management building block).

## Price/Performance

Different types of HIP building blocks have different pricing schemas. This is how different platforms are typically priced:

- **On-premises integration platform:** Software license or, increasingly, subscription (calculated either per processor or per user) plus yearly maintenance and support.

- **iPaaS:** Per edition (that is, amount of functionality) and number of connected endpoints. Yearly support may or may not be included.

- **Event brokers:** Software license or subscription (calculated per processor or per node) plus yearly maintenance and support.

- **API management platform:** Subscription based on a number of API calls per month plus yearly maintenance and support.

- **Metadata management tools:** Software license (calculated either per processor or per user) plus yearly maintenance.

- **iSaaS:** Per number of integration tasks per month.

It may be difficult to discern how to size each building block, so it is easy to overspend or underspend.

You should favor providers that allow you to calibrate your costs based on the increase or decrease of workload carried out by your HIP, instead of requiring a long-term fixed-price commitment.

## Alternatives to a HIP

Traditional integration platforms may have some of the capabilities of a HIP, but they generally do not offer full coverage of the HIP Capability Framework. As such, they may be used as starting points or building blocks for a comprehensive HIP implementation strategy, although in relatively

simple cases your specific HIP requirements may be met by one of these products (for example, an iPaaS). These alternatives to a HIP include:

- **On-premises integration platforms** (such as ESBs, data integration tools and B2B gateway software) provide a rich set of core integration capabilities, enable a range of integration patterns and target integration specialists. However, they primarily support on-premises endpoints, in many cases they are still unsuitable for hybrid deployment models, and they are usually far too complex for ad hoc and citizen integrators (although there are some products that do target ad hoc integrators).

- **iPaaS offerings** provide an ample set of core integration capabilities, enable a wide range of integration patterns, support hybrid deployment models and are designed for ad hoc integrators. However, in some instances, they have limited support for on-premises endpoints and, in most cases, enable citizen integrators only partially.

- **Event brokers** provide event mediation capabilities to distribute, govern and manage business event notifications, represented as structured messages. They provide publish-and-subscribe event dispatching and some or all of permanent event ledger, operational analytics, governance, security, monitoring and tracking, and other features. These include lightweight integration capabilities, such as the message-data filtering and transformation, and context-based event routing. However, they do not provide the rich orchestration, transformation and mapping capabilities of integration platform software and iPaaS. Moreover, integration specialists can use the development environment of most event brokers, but this is not the case for ad hoc or citizen integrators.

- **API management platforms** implement key governance features and manage access to any API-enabled endpoint. The most advanced offerings also support hybrid deployments (for example, via microgateways) and are a good fit for ad hoc integrators and integration specialists. However, being primarily designed for security and governance, they provide only rudimentary core integration capabilities and are usually not suitable for citizen integrators.

- **iSaaS offerings** are wholly focused on citizen integrators. They provide only very basic core integration capabilities, often do not support on-premises endpoints and, in most instances, do not enable on-premises or hybrid deployment models.

- **Integration brokerage (IB)** is a form of IT outsourcing that allows you to delegate responsibility for integration project fulfillment and ongoing maintenance to an external service provider. As such, IB is the most radical alternative because you do not implement your own HIP at all (although the IB provider probably uses one to deliver its services). For historical reasons, IB providers specialize in supporting large-scale B2B integration projects, but many of them have extended their IB services to cover a broader spectrum of use cases.

## Recommendations

- **Plan to deploy a HIP-inspired integration infrastructure over the next three years,** taking into account requirements arising from digital business initiatives, such as post-modern ERP, customer engagement, digital workplace, supply chain management, the API economy, supply

chain management, Industry 4.0 and ecosystems. Involve business leaders, development teams and other relevant roles in the requirements collection, design and technology selection steps of the process.

- **Gradually implement your HIP plan** by introducing, in a stepwise way, support for new constituents (such as citizen integrators), new endpoints (such as "things"), use cases (such as event stream ingestion, robotic process automation and the digital integration hub) and deployment models (such as multicloud). If possible, use the integration infrastructure you already have in place and fill its functional gaps with additional building blocks, such as iPaaS, API management platforms, metadata management tools and event brokers.

- **Take a highly pragmatic, open-minded and — where sensible — short-term approach** to selecting HIP building blocks. Assume that, sooner or later, you may have to replace some of these components as the HIP building blocks market matures and consolidates, as your requirements evolve or as you identify overlapping capabilities in your HIP's building blocks.

- **Expect that not all elements of your integration infrastructure will be under your direct control** and part of your HIP, as integration capabilities may be embedded in other products and services. However, in some cases, these embedded features may indeed be components of your HIP (for example, you may decide to strategically incorporate in your HIP implementation the iPaaS embedded in one of your SaaS applications).

- **Strike a balance** between two implementation approaches:

  1. HIP as a loose aggregation of multiple integration platforms under the control and governance of the ISET.

  2. HIP as a consistent, cohesive set of integration capabilities that use common development, life cycle management, metadata management, governance and operational tools.

  The former approach maximizes your flexibility at the cost of duplicated technologies and skills. The latter approach could deliver economies of scale and skill, but might require significant "assembly work."

## Representative Providers

The providers listed in Table 1 can supply all, or most, of the core building blocks for a HIP implementation. Therefore, you can consider them either as providers of individual HIP components or as potential end-to-end partners, if you want to procure all, or most, of your HIP capabilities from a single provider.

Table 1. Representative Providers of HIP Technology and a Sample of Their Offerings

| Provider | On-Premises Integration Platforms | iPaaS Offerings | API Management Platforms | Other HIP Building Blocks |
|---|---|---|---|---|
| Dell Boomi | ▪ Boomi Integration (formerly Atomsphere) | ▪ Boomi Integration (formerly Atomsphere)<br><br>▪ Boomi Exchange (B2B integration) | ▪ Boomi Mediate | ▪ Boomi Flow (low code workflow automation) |
| IBM | ▪ IBM App Connect Enterprise (formerly IBM Integration Bus)<br><br>▪ IBM Sterling B2B Integrator<br><br>▪ IBM InfoSphere Information Server | ▪ IBM App Connect | ▪ IBM API Connect | ▪ IBM MQ<br><br>▪ IBM Event Hub (event brokers)<br><br>▪ IBM Unified Governance and Integration Platform (metadata management tools) |
| Informatica | ▪ Informatica Intelligent Data Platform<br><br>▪ Informatica Integration Hub<br><br>▪ Informatica B2B Data Exchange | ▪ Informatica Intelligent Cloud Service (Cloud Application Integration, Cloud Data Integration, Cloud B2B Gateway and Cloud Integration Hub services) | ▪ Informatica Intelligent Cloud Service (API management service) | ▪ Informatica Intelligent Cloud Service (Data Quality and Governance and Data Security Cloud services) |
| Jitterbit | ▪ Jitterbit Harmony | ▪ Jitterbit Harmony | ▪ Jitterbit Harmony | ▪ N/A |
| Microsoft | ▪ Microsoft BizTalk Server<br><br>▪ Microsoft SQL Server Integration Services | ▪ Microsoft Azure Logic Apps<br><br>▪ Microsoft Azure Data Factory | ▪ Microsoft Azure API Management | ▪ Microsoft Flow (iSaaS)<br><br>▪ Microsoft Azure IoT |
| MuleSoft | ▪ Anypoint Platform (Mule ESB) | ▪ Anypoint Platform (CloudHub) | ▪ Anypoint Platform Manager | ▪ N/A |
| Oracle | ▪ Oracle SOA Suite<br><br>▪ Oracle Data Integrator<br><br>▪ Oracle GoldenGate | ▪ Oracle Data Integration Platform Cloud | ▪ Oracle Cloud API Management | ▪ Oracle Event Hub Cloud Service<br><br>▪ Oracle Internet of Things Cloud Service |

| Provider | On-Premises Integration Platforms | iPaaS Offerings | API Management Platforms | Other HIP Building Blocks |
|---|---|---|---|---|
| | ▪ Oracle Big Data SQL | ▪ Oracle Data Integrator Cloud Service<br>▪ GoldenGate Cloud Service<br>▪ Oracle Autonomous Integration Cloud<br>▪ SOA Cloud Service | | ▪ Oracle Enterprise Metadata Management<br>▪ Oracle Data Relationship Management<br>▪ Oracle Data Management Cloud (metadata management tools) |
| SAP | ▪ SAP Process Orchestration<br>▪ SAP Data Services<br>▪ SAP Replication Server<br>▪ SAP Data Hub | ▪ SAP Cloud Platform Integration<br>▪ SAP Cloud Platform OData Provisioning<br>▪ SAP Cloud Platform Connectivity<br>▪ SAP Cloud Platform Smart Data Integration | ▪ SAP Cloud Platform API Management | ▪ SAP Enterprise Messaging (event broker)<br>▪ SAP Cloud Platform Internet of Things<br>▪ SAP Cloud Platform Workflow |
| Software AG | ▪ webMethods Integration Platform<br>▪ webMethods CloudStreams<br>▪ webMethods Trading Network | ▪ webMethods Integration Cloud<br>▪ Built.io Flow (acquisition) | ▪ API Management Hub<br>▪ webMethods API Cloud | ▪ Cumulocity IoT<br>▪ Terracotta DB (in-memory DBMS)<br>▪ Universal Messaging (event broker) |
| SnapLogic | ▪ SnapLogic Elastic Integration Platform | ▪ SnapLogic Elastic Integration Platform | ▪ N/A | ▪ N/A |
| TIBCO Software | ▪ TIBCO BusinessWorks<br>▪ TIBCO Data Virtualization | ▪ TIBCO Cloud Integration<br>▪ Scribe On-line (acquisition) | ▪ TIBCO Cloud Mashery | ▪ TIBCO Messaging<br>▪ TIBCO Cloud Messaging (event brokers) |
| Workato | ▪ Workato Automation & Integration Platform | ▪ Workato Automation & | ▪ N/A | ▪ N/A |

| Provider | On-Premises Integration Platforms | iPaaS Offerings | API Management Platforms | Other HIP Building Blocks |
|---|---|---|---|---|
| | | Integration Platform | | |

Source: Gartner (October 2018)

## Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

"CIO Call to Action: Shake Up Your Integration Strategy to Enable Digital Transformation"

"Integration Strategies for the Digital Era Require New Delivery Models"

"Integration Personas and Their Impact on Integration Platform Strategy"

"How to Implement a Truly Hybrid Integration Platform"

"Market Guide for HIP-Enabling Technologies"

"How to Architect a Multicloud-Capable Hybrid Integration Platform"

"Use the Integration Maturity Model to Assess and Improve Your Integration Competency"

"Market Guide for Application Integration Platforms"

"Magic Quadrant for Data Integration Tools"

"Magic Quadrant for Enterprise Integration Platform as a Service"

"Magic Quadrant for Full Life Cycle API Management"

"Market Guide for Integration Brokerage"

"Hype Cycle for Application Infrastructure, 2016"

Note 1 Gartner's Hybrid Integration Platform Capability Framework

Gartner's HIP Capability Framework, shown in Figure 1, includes the following categories of functionality:

- **Role-based user experience (UX) —** The UX for different classes of users, including various types of integration personas (integration specialists, ad hoc and citizen integrators) and the HIP administrators. Through the UX functionality, authorized users can access the underlying HIP capabilities (including integration flow/API/event development, testing, deployment, execution, monitoring and management) based on their profiles and needs.

- **Prepackaged integration content —** This includes application and technology adapters, cloudstreams, integration templates, patterns, frameworks and other predefined (including industry-specific) integration content that users can configure, customize, extend and deploy. This content may come from technology or service providers or be developed by the user organization's integration specialists for reuse by ad hoc and citizen integrators.

- **Orchestration —** This enables HIP users to create multistep integration flows by composing multiple atomic integration functionality (for example, adapters, transformation and routing rules, conditional statements, and look-ups into external data sources).

- **Integration scenario-specific support —** Capabilities to enable specific integration use cases, typically application, data, ecosystems (including B2B partners), API and process integration. Emerging integration scenarios to be supported include IoT, event streams, digital integration hub, robotic process automation and artificial intelligence-based systems. Each of these scenarios may require specific capabilities that must be included in the HIP implementation when needed. For example, trading partner community management is required for B2B integration, offline data synchronization is often a need for mobile app integration, and high-performance event ingestion at scale is a feature that IoT integration often uses.

- **Digital integrator support —** These are capabilities that apply AI techniques to facilitate the resolution of complex integration problems. They may include machine learning, inferencing integration flow development, assisted data mapping, integration process optimization and chatbot-based developer experience.

- **API mediation —** Capabilities to create new ("outer") APIs by tailoring pre-existing ("inner") APIs to the experiences of different devices and channels. These include API orchestration, API mapping, monitoring and security.

- **Event brokering —** Capabilities to distribute, govern and manage business event notifications, including publish-and-subscribe event dispatching, permanent event ledger, operational analytics, governance, security, monitoring and tracking, and other features.

- **Core application and data integration functionalities —** These include data/message validation, transformation, mapping, aggregation, content base routing and application/technology adapters.

- **Communication styles and protocols —** These include support for multiple event-driven, request-drive and file-driven communication styles (request/reply, fire-and-forget, message queuing, publish and subscribe, file transfer) and protocols. Supported protocols include, but are not limited to, HTTP/HTTPS, FTP/S-FTP/FTPS, SOAP, RESTful/JavaScript Object Notation (JSON), Applicability Statement 1 (AS1/AS2/AS3/AS4), Java Message Service (JMS), Internet Inter-ORB Protocol (IIOP), electronic data interchange (EDI) and proprietary protocols.

- **Governance —** Functionality to govern the integration flows and APIs, such as API policy management and enforcement, integration artifact life cycle and metadata management, data quality and data masking, tracking of integration flow execution, and operational analytics for integration activity. Also included is an API, event and integration service catalog to support the role-based UX and the prepackaged integration content capabilities.

- **Operations —** Includes functionality to deploy, provision, administer, monitor and manage the HIP activity, enable and support high availability and disaster recovery, and secure access to the HIP capabilities.

- **Deployment models —** A HIP may be available as user-managed software deployable in an on-premises data center or in a IaaS platform, as a provider/managed cloud service, as a feature embedded in edge devices or as a combination of these models. It is not required that all the functionalities be deployed everywhere. Depending on the business and technical requirements, it may be sufficient that certain capabilities are segregated on-premises (for example, B2B integration software), others in the cloud (for example, development and operations), others in edge devices (for example, event brokering) and only a few deployed in multiple environments (for example, orchestration, core application and data integration, and API gateway). Some elements of the HIP can also be "embedded" into other products or services (for example, SaaS applications, mobile back-end services and integration brokerage services).

## More on This Topic

This is part of an in-depth collection of research. See the collection:

- Getting to the Details of the Digital Platform: A Gartner Theme Insight Report

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