# Best Practices for Implementing a Hybrid Data Management Architecture

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# Digital Transformation and Its Implications for IT.

Digital transformation is a buzzword. But dig beneath the hype and you will find something real—it's either the business opportunity of a lifetime, or an existential threat. Disrupt, or be disrupted.

Digital disruption is about building new business models that leverage data to create new and innovative products and services. What will separate the winners from the losers in the coming years is the ability to build a distinct competence in data management as the foundation of business strategy.

The challenge for every organization is that data management complexity is skyrocketing just at the time when the business needs better, more trustworthy data, faster than ever before.

What's holding data delivery back?

- Application silos make data hard to discover and access.

- Data volumes double every two years.

- Data complexity is increasing faster still. Around half of all enterprise data comes from outside sources, which means little control over formats, quality, or definitions.

Here's a data-based paradox: We're drowning in the very thing we can't find, access, understand or properly deliver.

McKinsey and Company found 86 percent of executives surveyed were "at best only **somewhat effective** at meeting the primary objective of the data and analytics program." They also found that data management was the top technical challenge blocking success.[1]

As organizations adopt cloud applications and analytics, their data management becomes more complex than in a simple, on-premise-only environment. And it's not just one cloud, either. "Cloud" is very likely to mean multiple ecosystems and applications. It has become a hybrid world. To compete in this environment, organizations need an end-to-end hybrid data management platform to deliver enterprise data quickly and securely across cloud, hybrid, and on-premise environments.

To keep up with the changes, organizations need to focus on various internal business units supporting the transformations, a critical unit being the Integration Competency Center (ICC). Today, competency centers are not only challenged to identify the right platform and solutions to serve the business, but also to identify services that would help them adopt a balance between enabling self-serve integrations with existing governance protocols.

[1] "The need to lead in data and analytics," McKinsey and Company. April 2016. http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-need-to-lead-in-data-and-analytics

# What Does Hybrid Mean to You?

Not only has cloud computing drastically reduced the costs of enterprise technology, it's also empowering IT departments to finally deliver the agility, elasticity, and innovation that the business needs. But even though the vision for many enterprises may be an entirely cloud-first—or even cloud-only—technology stack, the current reality for most is still a hybrid architecture of legacy on-premise technology and newer cloud services. Most important, with several heterogeneous ecosystems and players in the cloud space, even a cloud-only strategy will still be a multi-platform strategy. **At the heart of every cloud strategy, there needs to be a cohesive hybrid integration strategy**. One that accounts for multiple vendor ecosystems, new user roles, new technical requirements, new data types, exponential increase of data sets, and a range of new security considerations.

### A Simple Hybrid Approach.

If you are a cloud-first kind of company, then you'll probably be looking at a platform that will help you integrate all your cloud-based SaaS applications with your existing on-premise data to give you a holistic view across the complete enterprise data. This is a "simple" form of hybrid integration. In this case, an Integration Platform as a Service (iPaaS) solution would help fulfill the requirements to integrate data, applications, and processes across hybrid environments—cloud and on-premise.

The simple hybrid paradigm works well when organizations are starting out with a cloud-first approach to integrate cloud applications and data sources. Sometimes, they could also be departments within larger enterprises that adopt iPaaS to meet their line-of-business integration needs.

Cloud Applications
and Systems

Application
Integration

Cloud Integration
(iPaaS)

Data
Integration

On-premise Applications
and Systems
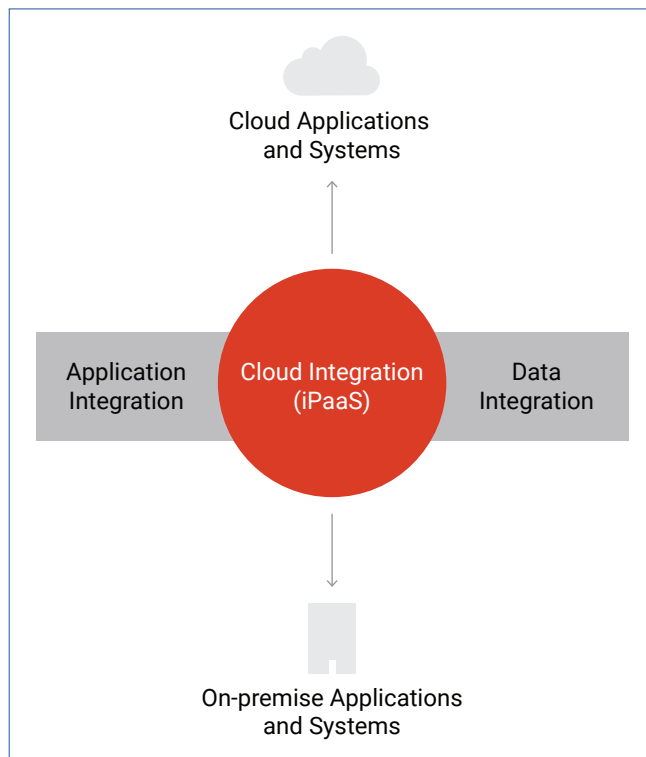
Simple Hybrid

## An Advanced Hybrid Approach.

However, as organizations evolve, the complexity around managing data also changes—not just in terms of data sources or data volume but also with newer use cases. This calls for a more mature platform to handle the growing complexity. This is an **"advanced"** form of hybrid integration. This is what the next-generation
of iPaaS is all about. It is a single, modular, and metadata-driven platform integrating big data, cloud, and on-premise systems that supports advanced integration use cases such as the Internet of Things, business-to-business, integration hub, and other complex data management solutions for both business and IT users.
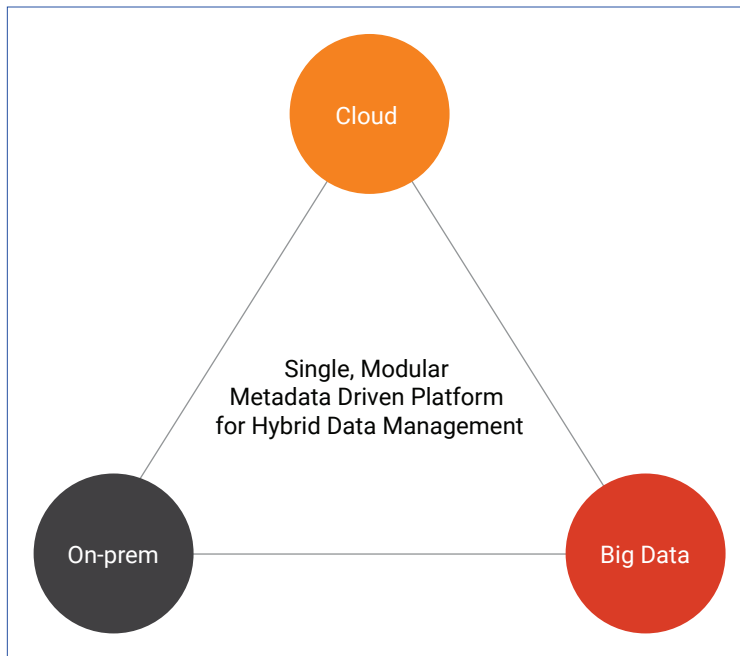


Advanced Hybrid

# High Productivity and High Control.

The challenge for IT today is twofold. First, it's about controlling and governance of the immense complexity of heterogeneous integration needs across multiple on-premise and cloud environments. And second, it's about doing so while increasing productivity of users across business units at unprecedented speed and scale.

To balance the trade-offs between productivity and control, IT, more than ever, needs a platform with the right toolsets that gives them visibility and the line-of-business control, while providing agility for the entire organization.

As lines of business aggressively adopt new applications and data sources, the technology landscape continues to be fragmented and harder to govern and manage in the short term. What's required is a new integration strategy for IT so that it can govern effectively, while establishing best practices for business users without slowing down their processes and projects. Another imperative for a balanced strategy that benefits both IT and the business is the ability to plug in any data or application of choice with a flexible platform, as well as offer a broad spectrum of DIY integration tools to support all types of users, along with systematic governance and monitoring solutions.
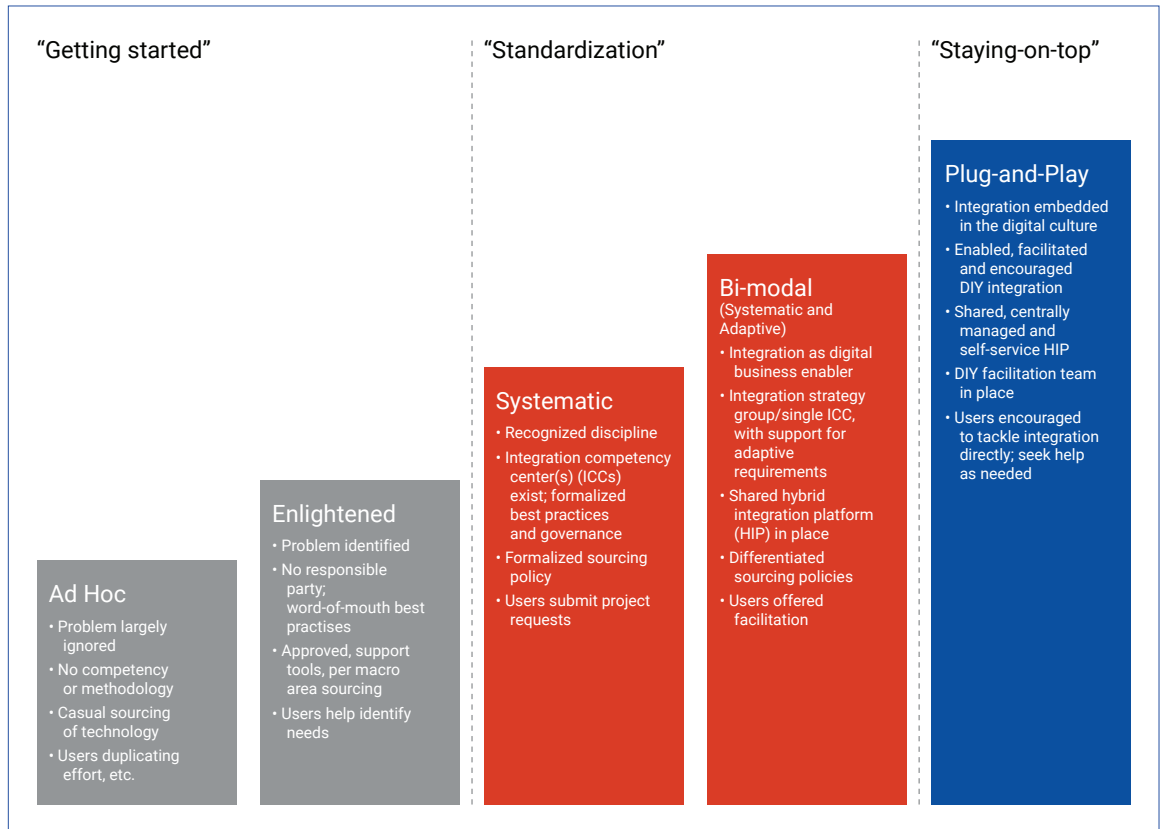
# The Changing Role of IT.

Data is at the core of digital transformation, so it's no surprise integration has become critical. Organizations are actively revising internal business processes and IT teams around their integration strategies. What's needed is a well-defined model to map out IT transformation as the focus shifts once more to Integration Competency Centers.

In its report, "Use the Integration Maturity Model and Improve Your Integration Competency," Gartner writes: "We estimate that 55% of Gartner clients (including SMBs and large enterprises) are in the 'getting started' phase at either level 1 (ad hoc) or level 2 (enlightened)."[2]

Informatica believes that if your organization is undergoing this transformation and you're planning to include your Integration Competency Center, you might want to adapt some of the requirements of the two higher models, Bi-modal and Plug-and-Play.

[2] Gartner, "Use the Integration Maturity Model to Assess and Improve Your Integration Competency," Elizabeth Golluscio, Keith Guttridge, Massimo Pezzini, Eric Thoo. 17 August 2016.

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"Getting started" — "Standardization" — "Staying-on-top"

**Ad Hoc**
- Problem largely ignored
- No competency or methodology
- Casual sourcing of technology
- Users duplicating effort, etc.

**Enlightened**
- Problem identified
- No responsible party; word-of-mouth best practises
- Approved, support tools, per macro area sourcing
- Users help identify needs

**Systematic**
- Recognized discipline
- Integration competency center(s) (ICCs) exist; formalized best practices and governance
- Formalized sourcing policy
- Users submit project requests

**Bi-modal**
(Systematic and Adaptive)
- Integration as digital business enabler
- Integration strategy group/single ICC, with support for adaptive requirements
- Shared hybrid integration platform (HIP) in place
- Differentiated sourcing policies
- Users offered facilitation

**Plug-and-Play**
- Integration embedded in the digital culture
- Enabled, facilitated and encouraged DIY integration
- Shared, centrally managed and self-service HIP
- DIY facilitation team in place
- Users encouraged to tackle integration directly; seek help as needed

Pervasive Integration Maturity Model from Gartner[3]

Note: The maturity model considers the challenge of handling "pervasive integration," and accounts for all disciplines (spanning application, data, B2B [ecosystem], and process integration domains) and all endpoints (such as APIs, on-premise data and applications, cloud services, mobile apps and Internet of Things [IoT] devices).

[3] Gartner, "Use the Integration Maturity Model to Assess and Improve Your Integration Competency," Elizabeth Golluscio, Keith Guttridge, Massimo Pezzini, Eric Thoo. 17 August 2016.

What follows is the Informatica perspective on how each stage would manifest itself inside an organization.

### Level 1: Ad Hoc.

Point-to-point integration projects are being adopted and driven by individual lines of business. There's no centralized ownership, specialized integration teams, or any specific integration tool or platform.

### Level 2: Enlightened.

The company's IT leaders are aware of their integration problems, but there's still no formal team or ownership. Projects are run by regular developers, and multiple integration tools are evaluated, but decisions on which tools to choose are delegated to individual lines of business.

### Level 3: Systematic.

One or more formal Integration Competency Centers now exist. They handle global integration projects and focus on disciplined approaches to the various use-cases, such as data integration, application integration and B2B integration. There is also a structured evaluation process for selecting the right integration tools. This is managed either by central IT teams or federated according to lines of business, but it's governed by IT policies and compliances.

### Level 4: Bi-modal (Systematic and Adaptive).

The Integration Competency Center has become a critical enabler of digital transformation both in terms of how it delivers integrated solutions and how it enables self-service DevOps teams and business integrators. Bi-modality allows IT to adapt and support the individual ad hoc integration needs of the various business units without compromising on more formal, systematic approaches.
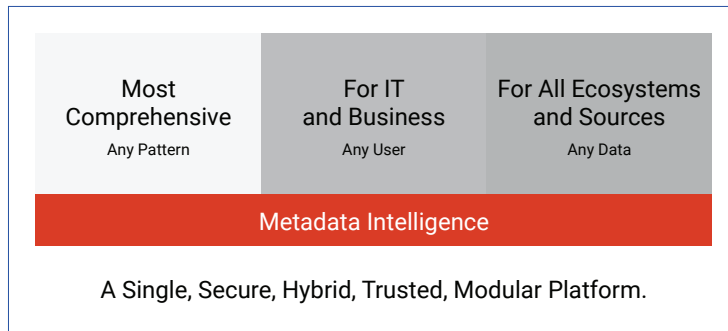
The Integration Competency Center or Strategy Group is responsible for formulating and maintaining all adaptive and systematic integrations, using a variety of tools to address all types of use cases—applications, data, B2B, IoT and big data—typically supported by Integration Platform as a Service (iPaaS) and/or cloud-based citizen integrator tools.

### Level 5: Plug-and-Play.

Integration is now a core part of the company's digital culture, driving innovation and transformation. The traditional systems development life-cycle is complimented by a data-first agile delivery model. Bi-modal capabilities remain, but cross-organizational competency centers are also being adopted. These include various internal and external stakeholders.

IT is no longer centralized nor fully responsible for integration competency. Instead, the cross-functional body facilitates DIY integrations, based on a managed catalog of data, to support new types of users: Ad hoc integrators, such as developers and SaaS administrators, and citizen integrators (business users), who are occasionally in charge of one-time integration tasks to accomplish their business mission.

# The Hybrid Data Management Architecture and the Informatica Approach.



| Most Comprehensive | For IT and Business | For All Ecosystems and Sources |
|---|---|---|
| Any Pattern | Any User | Any Data |
| Metadata Intelligence | | |

A Single, Secure, Hybrid, Trusted, Modular Platform.

Hybrid Data Management Platform

The foundation of a hybrid architecture is an intelligent metadata-driven platform with insights into and centralized control over the data and applications being integrated. The platform provides an object-level understanding of the systems it's connected to; a visual map of objects; hierarchies within objects; and an understanding of the way objects relate to each other to prioritize and differentiate how data is managed.

This global repository of metadata gives businesses the ability to reuse connectors, transformations, and business logic across their environment.

- It increases developer productivity and reduces the amount of time it takes to provision connectivity, thereby lowering the cost of switching between different platforms.

- It increases your visibility into how different patterns are executed and different data sources are managed, making it significantly easier to govern and maintain best practice.

**Informatica Enterprise Information Catalog** comprises a discovery engine that collects and increases the understanding of enterprise data assets through a graph-based information catalog. Powered by Informatica's unique metadata services engine, it provides business and IT users with powerful semantic search and dynamic facets to filter search results, data lineage, profiling statistics, 360-degree relationship views, data similarity recommendations, and an integrated business glossary. Data stewards can now easily and efficiently manage enterprise data assets to maximize their value throughout the company. Business users can quickly add data and easily manage the lifecycle of business terms, definitions, reference data, and more.
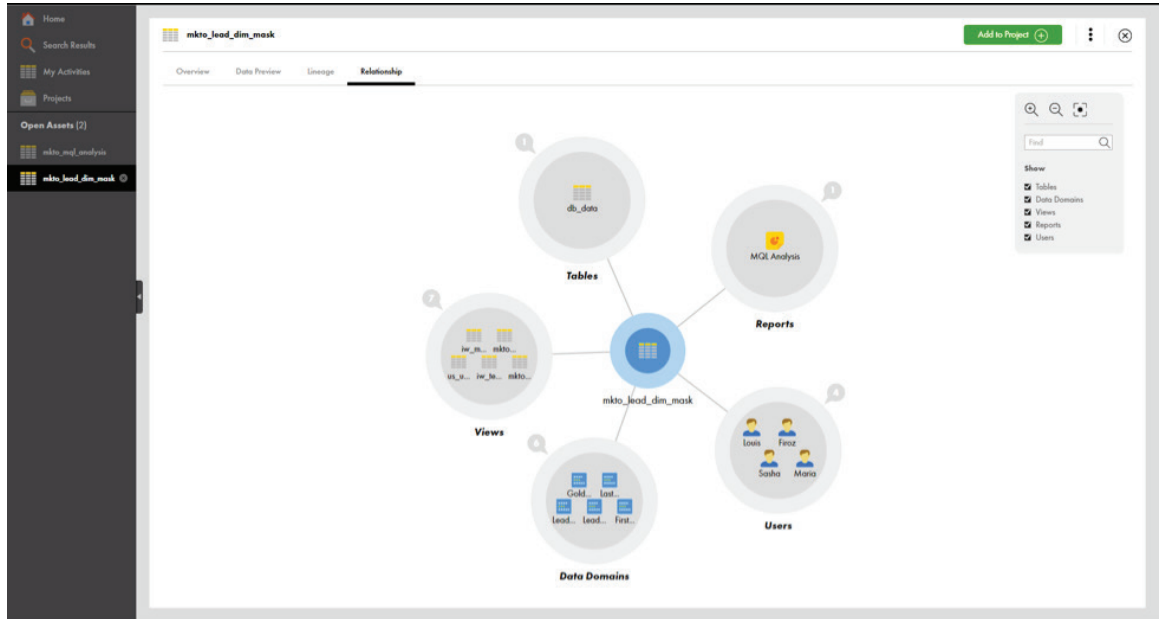


Based on the platform are advanced cloud services to help integrate, manage and prepare data for better insights and analytics. The hybrid architecture supports any integration use-case like data, applications, B2B, big data, SaaS, mobile, and the Internet of Things. Given the pace of innovation, it's important that the platform is designed for change and can easily incorporate the latest capabilities in fast-moving areas of hybrid data management.

Informatica Cloud/Integration Platform as a Service (iPaaS) combines various integration use-cases including application and data integration, B2B, integration hub, IoT and big data. It enables development, execution, and governance of integration workflows in batch and real-time modes. It offers a broad range of native connectivity to disparate data sources across cloud and on-premise applications, as well as a robust API framework, extended by cloud-based services, such as master-data management, test-data management, data quality, and security.
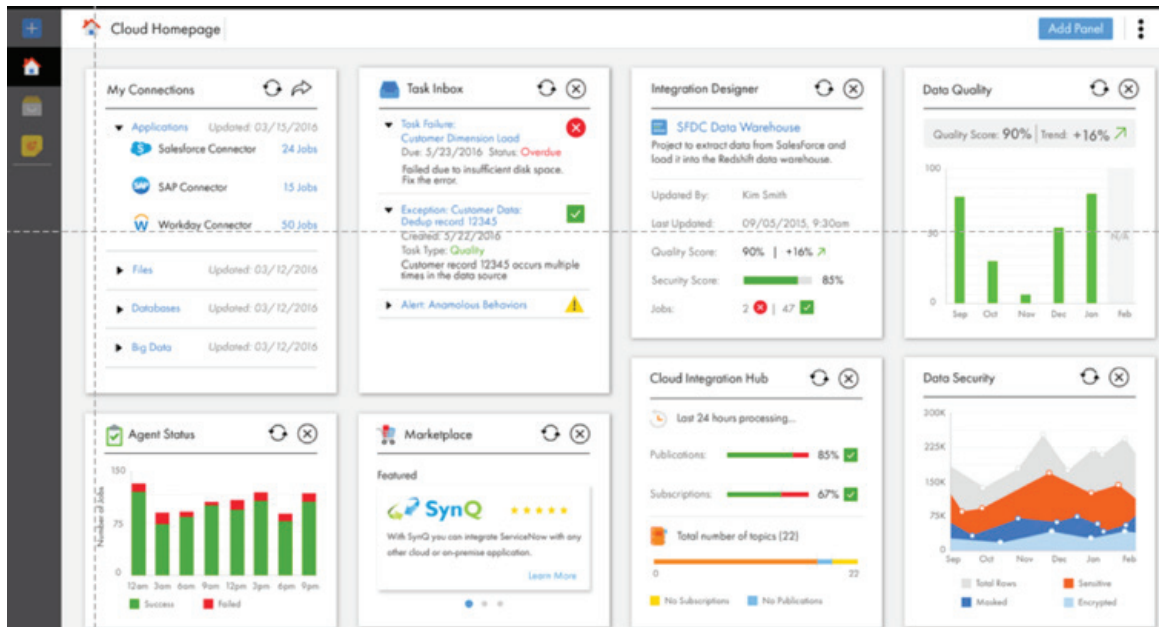
**Informatica Integration Hub** empowers large organizations to embrace change and the opportunities of new applications and analytics systems, while managing storage in Hadoop as well as relational database and file store options. The centralized modern hub-based architecture is the foundation for agile and managed enterprise data integration. The Data Integration Hub simplifies the delivery of fresh and clean data to all analytics systems and application-to-application data integration, so that organizations can support any volume, format, latency, or protocol within a single data integration platform. And because it's a hub, it centralizes data management, monitoring, and control in a web-based console. This ensures that data moving through the hub is trustworthy, secure, and traceable.
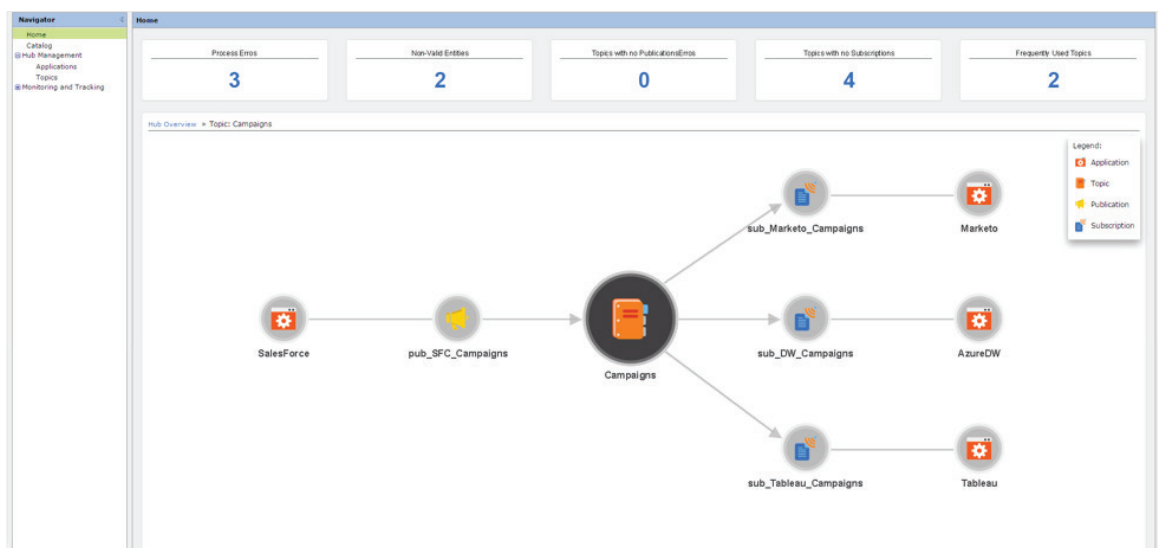


Hybrid integration between **Informatica PowerCenter and Informatica Cloud** lets organizations make sense of their data by connecting to their on-premises and cloud data sources. PowerExchange for Cloud Applications enables PowerCenter to connect to any cloud applications/data sources seamlessly, like any other on-premise data sources. PowerCenter customers can easily leverage existing technology and skills while they make their journey to the cloud.

# Best Practices for Evolving the ICC.

In the context of digital transformation, an architecture is not just a technology or IT consideration.

Architecture starts with a structured view of the **business**: The ecosystem in which it operates; the products and services it provides; the markets and customer segments it serves; and the workers and stakeholders that get the job done.

Next, we take an **operational** view. It provides a framework for describing what the organization does; the structure for organizing and governing activities; how the work flows through the functions to deliver value; and what information is exchanged in the operational model.

Then we have a **systems** view. It shows how the business processes are automated; where data is stored (increasingly scattered in multiple internal and cloud repositories); and how data is exchanged between systems.

Finally, we have a **technology** view. The hardware, software, and communications technologies coming together in a vast array of patterns to provide operational platforms for the systems.

In each of these views—business, operational, systems and technology—our architecture best-practice defines the current state, the target state, and the migration strategies to reach the target state.

Put simply, architecture provides a holistic perspective of the organization, rather than merely an IT perspective.

So, what are those best practices for achieving digital transformation? Fundamentally this is about data, so there's an overarching need for an Enterprise Data Competency. Underneath that, we've grouped the best practices into three categories of competency:

- **Integration Competency:** The ability to connect disparate streams of data throughout the organization in an agile, efficient and continuously improving manner.

- **Information Competency:** The ability to manage the meaning and context—and therefore the business value—of data.

- **Transformation Competency:** The ability to make complex cross-functional changes in the business in response to market conditions, technology advances and business opportunities—not just once, but as an ongoing discipline.

First, it involves **establishing a culture that makes fact-based decisions and uses data to run the business** on a day-to-day basis. Some organizations may already have well-established practices, such as broad-based Lean or Six-Sigma programs. These organizations reformulate vague qualitative pain points into crisp, quantified problem-statements supported by facts. They make effective use of key performance indicators (KPIs)[4] to make well-informed business decisions.

If you're going to run your business on data, you need to be able to find it. You need:

a. relevant competencies in the portfolio of enterprise applications and external data sources,

b. to extract and deliver the data to analytic and operational environments,

c. and integrate, reconcile, and enrich data across multiple sources.

Then you have to deliver the resulting trusted information to the right stakeholder at the right time, in the right business context, to generate the requisite analytic insights and optimize business processes. Each of these competencies presents challenges, but it is well worth the effort to master them.

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[4] Generally developed by a Business Intelligence Competency

Second, enterprise data competency involves **using analytics to gain insights that drive innovation** and increase the business's competitive advantage. For example:

- Combining social media sentiment analysis with internal operational data to learn how changes in product features, pricing, bundling, delivery, and servicing could leap-frog the competition.

- Using analytics to answer strategic questions, such as: Which products should we be offering, in what markets, to which customer segments, and at what price point?

The third aspect of enterprise data competency involves **simplifying the IT infrastructure and automating processes** to modernize the business. Strategically, modernizing the organization's vision, goals, opportunities, and related activities can maximize the business benefits of digital initiatives and defend against non-traditional competitors looking to disintermediate well-established enterprises.

A "digital strategy" or "modernization strategy" is not the same as an "online strategy." Digital strategy connotes deeper interactions with customers, more customized and personalized offerings, and organizational models and processes that are more reactive to changes in the marketplace. This deeper and more automated interaction with customers demands a higher degree of data quality and plug-and-play capability than is needed for traditional, manual, employee-assisted processes.

The fourth aspect is **having data that you and your customers, partners, and regulators can trust**. For data to both power your business and satisfy regulators, it must be timely, accurate, transparent, and accessible to those who need it—and protected against those who don't. Establishing trust requires competencies for data transparency, accountability, verification, and change control, which are also key characteristics of maturity level 3 (systematic integration).

Finally, the fifth aspect of enterprise data competency involves **applying a disciplined approach to protecting data assets**. The three dimensions of data protection—security, privacy, and compliance—each require several competencies and operational capabilities. After all, since data is a valuable asset, it needs to be protected from theft, loss, or misuse. In terms of compliance, there isn't a single industry that doesn't have regulatory or legal requirements that need to be governed. Some industries, such as healthcare and financial services, have particularly demanding standards.

In summary, the ICC is the process of making significant changes to your business by leveraging the power of data assets on an ongoing basis.