

Modern
Architect
Series

Building Modern Architectures Through Fabrics

A reference model for the journey to the cloud



 salesforce app cloud

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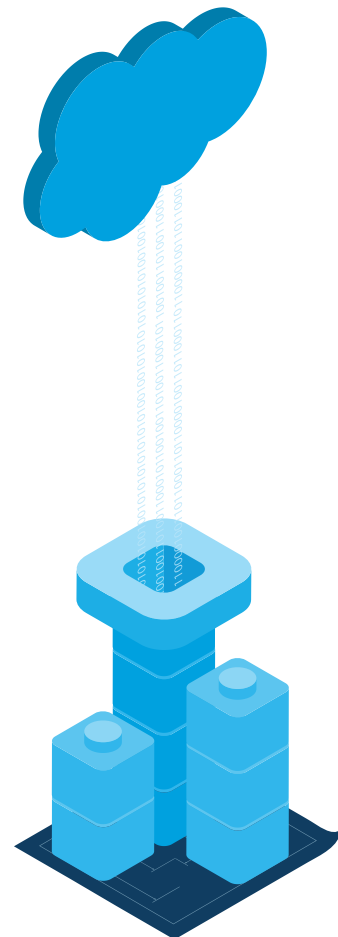
1. Introduction

In the accelerated world of business growth, what started as a whisper is now a scream for a disruptive approach to Enterprise Architecture. No longer is it possible to construct a technology only system from the bottom up, built to stand static for decades.

The business of technology of the now, near, and distant future is evolving at a rate that will only increase. IT leaders need to fundamentally reconsider the way they approach, design, communicate, and ultimately deliver systems that provide business outcomes to match and exceed the demand of flexibility. Of course, all of this must occur through a set of trusted, robust and resilient solutions that can stretch and morph in unforeseen new directions.

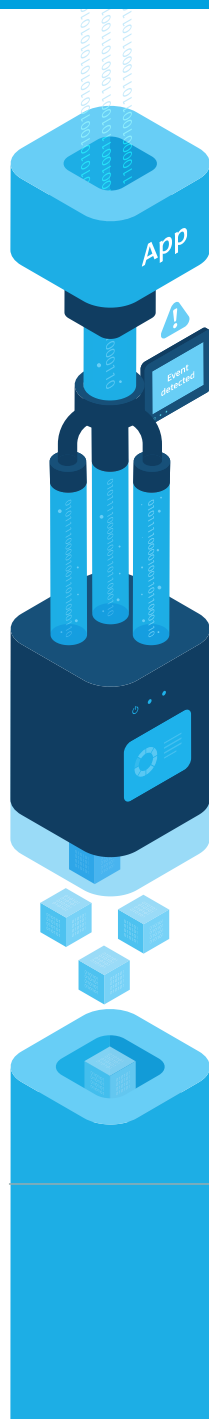
As an Enterprise Architect, CIO, or CTO, you understand how threads of information are woven throughout internal systems, the cloud, partners, devices and numerous other entities that are connected to your organization. The question is: how do you approach your current set of applications and ensure that it is truly ready to evolve to these “Modern Architectures”?

This book introduces you to a process to think through your Business and IT plan as you begin to create this new world. Further, it presents a pragmatic way to create, manage, and begin the journey towards a truly flexible, futureproof architectural strategy.



2. Modern Architecture Defined

“Modern Architecture” is a fresh look at how Enterprises pivot towards the future using both new and existing technologies, specifically cloud technologies. As Salesforce works with some of the largest brands and government agencies in the world, we have learned that such cloud architectures are rooted in a number of basic realities:



Smart “Hybrid” Application Approaches: the data locked in on-premises and legacy systems needs to be quickly “surfaced” to the cloud through lightweight integration, API- first thinking, and in-memory analytics in some cases cutting delivery to hours instead of months.

Agility as a way of life: rapid prototyping, effective Product Owners, and visible, defensible backlogs must be supported.

Future-Proof by Design: changing process automation requirements, IoT, and other data-intensive trends are forcing applications to evolve rapidly. Metadata-driven platforms provide the right flexibility to allow Architects to pivot and act instead of react. Also, support for both model-driven and elastic approaches are critical to success.

Developer Democratization: conventional development approaches are giving way to “composability” – ranging from drag-and-drop component assembly to functional components that can be “snapped into” the ecosystem. Tooling needs to continually move up the “food chain” resulting in rich palettes from which to compose and assemble.

Event-Driven: the combination of the mobile revolution and the coming IoT tsunami of big data shows a clear trend towards “apps” and the supporting ecosystem becoming much more event-driven.

3. Business Planning in the New World

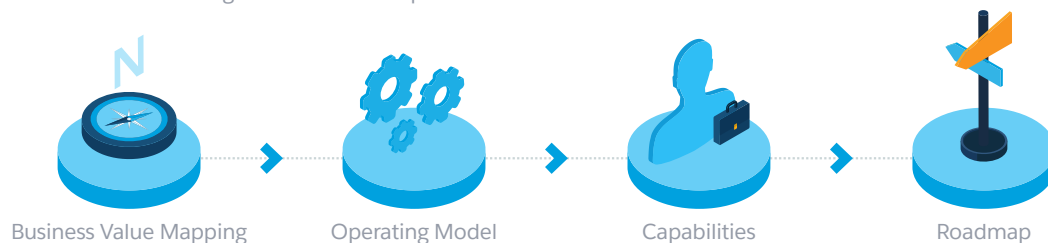
But how can the Business and IT conversation lead to genuine business transformation? At Salesforce, we have observed that understanding the true goals of the enterprise and the go-forward operating model are great ways to deepen this conversation, and must be shepherded by the Enterprise Architect throughout this journey.

Governance structures and bodies must continually focus on actionable business outcomes to main their credibility and effectiveness. We have seen that the basic steps to make this happen include:

Mapping Business Value: while there are a variety of ways to accomplish this, a great approach is to assemble a cross-functional team of your most customer-centric employees and have them reimagine and challenge their customer experience views. Salesforce's Ignite¹ "Art of the Possible" exercise is both instructive and invaluable and can help define a "true north" for this transformation.

Defining the Operating Model: understanding the current (and target) operating model is critical to identifying the true rules of the road regarding decision-making, funding, and required standardization and integration of business processes². More importantly, it serves as a set of conversational guardrails when projects or programs invariably decide to adopt exceptions ("remember we agreed to...?").

Creating Capabilities, Value and Process Maps: after understanding the business value map and the target operating model, a series of workshops can flush out the required business capabilities and key process maps. This produces a comprehensive understanding of the "what" (capabilities), and the "how" (processes), which are combined to enable a go-forward roadmap.



1 - <http://www.salesforce.com/ignite/> | 2 - Enterprise Architecture as Strategy, J. Ross, R. Weill, D. Robertson
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4. Where Architecture Approaches Fail

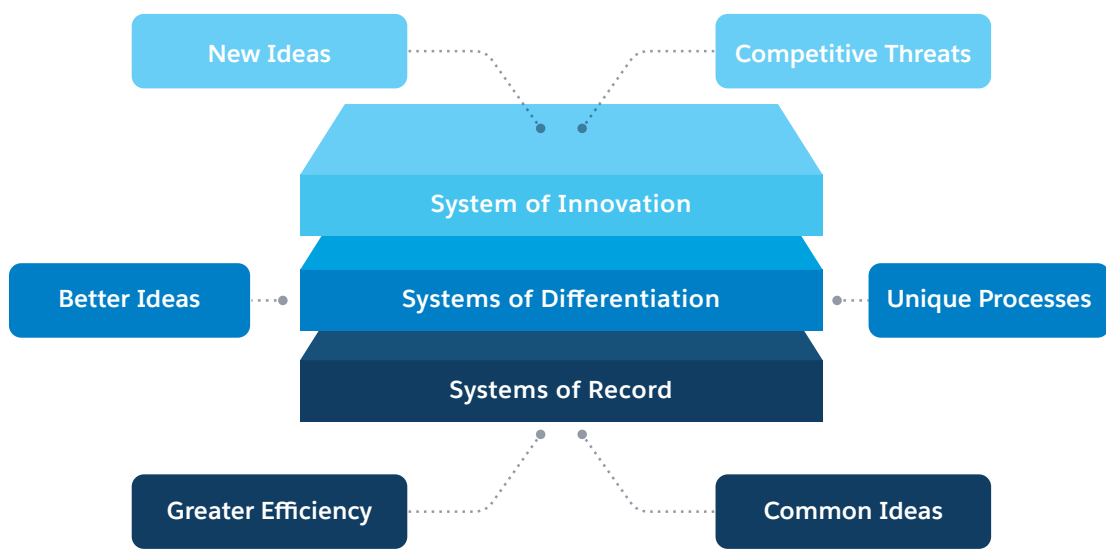
Most Enterprise Architects have strong backgrounds in one or more architectural methodologies. However as Business and IT Leaders further consider Modern Architectures, there are a few uncomfortable, but true observations about traditional IT architectures and how they typically come to life:

Historical Enterprise Architecture methodologies (TOGAF, Zachman, FEA) were effective ways to approach first and second-generation architectures. However, they are a challenge to adapt to agile, Modern Architectures, and sometimes do not always resonate with Business stakeholders, who are more focused on business outcomes than diagramming and repositories, and other mapping exercises. Furthermore, the focus on artifacts rather than partnership and alignment with business goals is often a challenge to reconcile.

“Fit for purpose” approaches typically cannot capture the continuum of legacy applications through emerging technologies with any resiliency. Often, such application architectures stumble forward and remain technology-driven and not capabilities-driven. In addition, such bespoke approaches lead to solutions that are all too breakable and hence short-lived.

Traditional vendor technology “stacks” are oftentimes brittle, tightly coupled, or require so much custom integration (along with a large amount of code and maintenance) that they are virtually unsustainable. We live in a hybrid, heterogeneous world – and the Holy Grail of a single-vendor solution continues to be both unrealized, and unrealistic.

Gartner’s Pace Layering and Bi-Modal IT³ have forever changed the industry conversation between IT and the Lines of Business (LOBs). In working with many customers, however, we have repeatedly heard that such concepts do not always drive to sufficient level of detail. Salesforce has assisted many Enterprises to wrapping “legacy” systems with an “agility layer” to both unlock back office data and jump start the transformation. However, customers continue to demand more detail on how to truly take advantage of these concepts.



5. Planning in the New World

In many Enterprises, architecture planning processes are fragmented, siloed or even nonexistent. Application portfolios are typically large, duplicative, and oftentimes managed purely from an operating cost perspective vs. a TCO / go-forward business value perspective.

Also, while many Enterprise IT functions create “blueprints” or “roadmaps” as part of their annual planning cycles, these often become snapshots that quickly lose relevance and are neither regularly updated nor sustainable.

Finally, while reference architectures are a powerful planning and communications tool, they continue to be challenged to be simultaneously rigorously constructed and simple (yet not simplistic).



Enterprises can approach an actionable roadmap in this manner:

Reboot the Portfolio: take a hard, value-based look at the current/planned application portfolio - this, combined with the Operating Model and Business Value Mapping from earlier in this eBook help form a pragmatic but future-facing roadmap for the transformation.

Adopt a Reference Architecture that actually works. We have observed that reference models tend to be either very high-level (and generic) or too specific (and hence brittle by nature) and present the “fabrics” model in the next section.

6. Reference Models that Actually Work: fabrics

Consider the idea of “fabrics”, hierarchical groupings of technical components that directly enable the Modern Architectures.

fabrics are:

Intuitive: they make sense to non-practitioners so Business and IT can understand and easily discuss them

Intelligent: they can filter and react to events and also massage data and execute business rules

Flexible: they are resilient and scale/stretch as needed (too many fabric layers lead to complexity impossible to manage; too few lead to generalities and architectural chaos)

Component-based: they support API-first, Micro-service, and object-oriented concepts including abstraction, isolation, and independence.

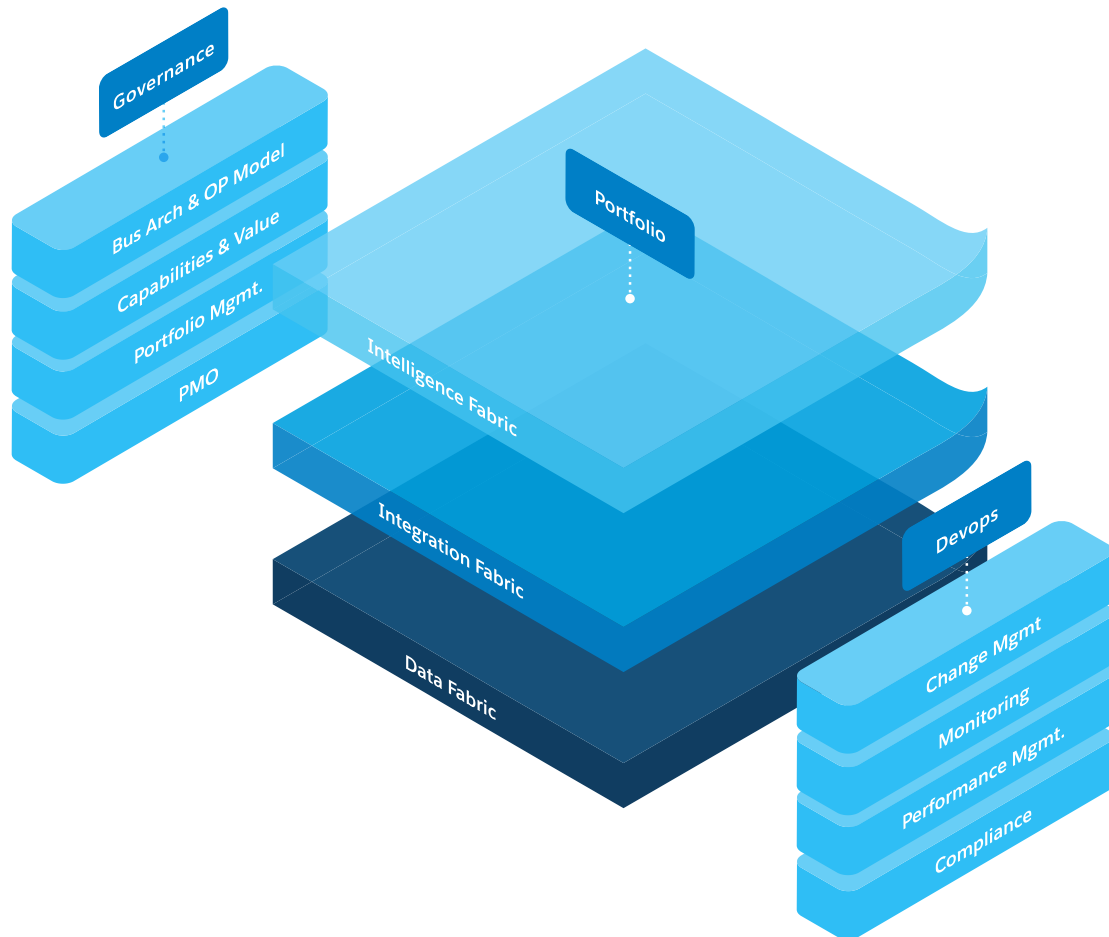
fabrics are not:

Products: in the real world of hybrid applications, no single vendor provides a complete solution; fabrics by design will blend a number of technologies and providers (both planned and current).

Rigid: instead of stacks of components, think firm in the middle and malleable on the interfaces. Fabrics represent distinct functions per level, but will flex based on use cases, patterns, and emerging capabilities.

Static: instead of tightly coupled end-to-end chains, they will change over time, with a manageable impact on the rest of ecosystem. Think loose coupling with interfaces that are “plumb able”.

Fabrics are the manifestations of the deployed and evolving portfolio, and are supported by Governance processes (specifying the portfolio) as well as DevOps (caring for the portfolio) as shown below:



7. What's a Data fabric?

Data fabrics are made up of subject areas that are common to Enterprises.

Typically, they are centered around [Systems of Record](#), or single sources of truth for a particular area. Common examples are:



- Core Transactions and Logistics Systems (including Enterprise Resource Planning ERP)
- Sales and Service
- Human Capital Management and Human Resources
- Content Management (Documents, Email)
- Industry-specific Sources (Clinical Trials for Pharmaceuticals, Trade Capture for Financial Services, Operations Support Systems for Telecommunications)

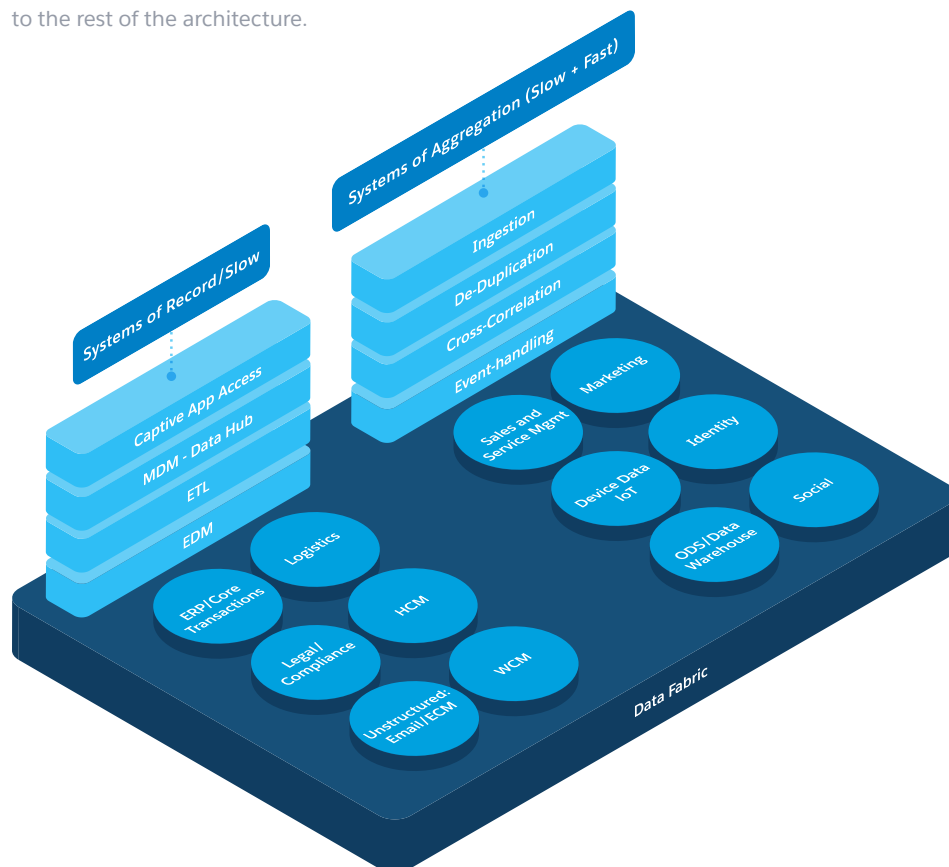
Note that Systems of Record are more than just databases; they include ancillary functions including dedicated User Interfaces, Master Data and Enterprise Data Management tools, and similar subject-area specific, dedicated functionality.

Another part of the data fabric is **Systems of Aggregation**, or systems that combine or distill information from other sources. Examples of these include:



- Data Warehousing (traditional Data Warehouses, Data Marts, Operational Data Stores)
- Social Media Data (Twitter, Facebook, LinkedIn)
- Marketing and Campaign Data
- Identity Management (including entitlements)
- Raw Device and Sensor Data

Systems of Aggregation can also include data ingestion, enrichment, and context-awareness and have the ability to “signal” other fabrics and services. Combined, the Data Fabric provides the lifeblood of the Enterprise – Data, to the rest of the architecture.



8. What's an Integration fabric?

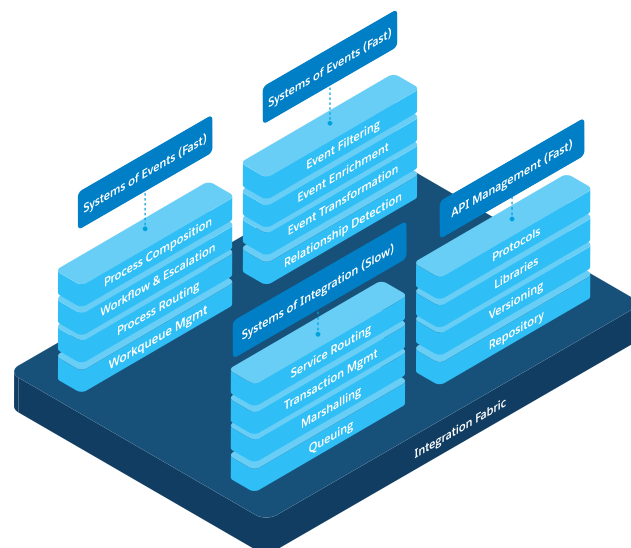
The Integration fabric further enriches the Data fabric through additional combinations and operations that leverage both external and internal capabilities. It includes:

Systems of Integration (note that these systems are typically focused on system-to-system operations):

- **Service Orchestration** – combining low-level service calls into usable transactions and functions; this is classical “middleware” and Services Oriented Architecture (SOA) functionality.
- **API Management** – pulling together services that are “composed” through MicroServices and API-first approaches and making them secure, visible, and consumable.

Systems of Events (note that these systems are typically focused on system-to-human or system-to-device operations):

- **Process Choreography** – taking events and transactions from the lower levels of the architecture and further filtering and “surfacing” them for consumption by human and automated workflow processes.
- **Event Processing** – collating, filtering, analyzing, and processing high numbers of transient events, which raises appropriate signals for consumption.



9. What's an Intelligence fabric?

As Data Science becomes part of the Enterprise portfolio, the “Intelligence fabric” further enables smart, scalable, and configurable ways to navigate applications and data for business value.

It consumes events, data, and signals from the Integration Fabric and provides three critical functions

Social Feed – the cross-application ability to “follow” events, people, records, and files along with a consumable way to share and filter critical information to humans or smart endpoints (including wearables and other devices).

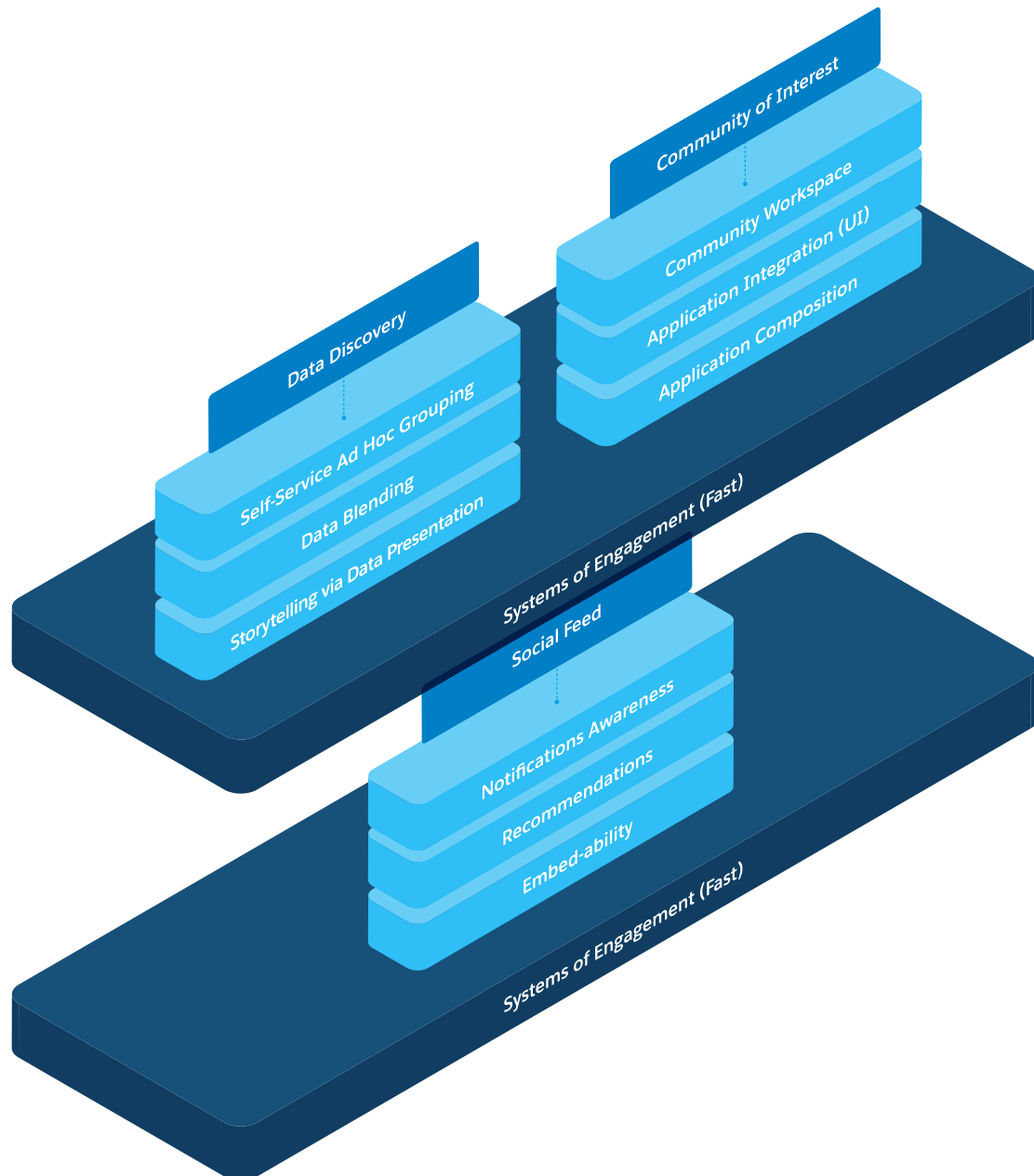
Systems of Engagement – provides customers with new ways to view application and business information, eliminating the “swivel chair” approaches of the past. These include:

- Communities of Interest providing visibility to events from the Social Feed layer and accessing data via various APIs and event sets.
- Data Discovery – gaining rapid insights and answers on a self-service basis. Note that this capability is included here because Salesforce believes that self-directed analytics is a fundamental goal of ModernArchitecture-based approaches.

Systems of Intelligence – automated ways to enrich every customer interaction:

- Modern Web and Mobile interfaces bring business data (surfaced from the Integration Fabric) for consumption by business users, partners, and customers, all in a safe and secure way.
- Wearables and IoT experiences succeed or fail based on surfacing the right information and signals at the proper time.

The Intelligence fabric is especially exciting, as it points the way to the future of apps: mobile, social, wearable, and event-driven, all within a secure and trusted business context.



10. Fabrics Applied to “Two-Speed” Architectures

The fabrics-based Reference Architecture summary is shown in the figure below. Bear in mind these important distinctions across the model:

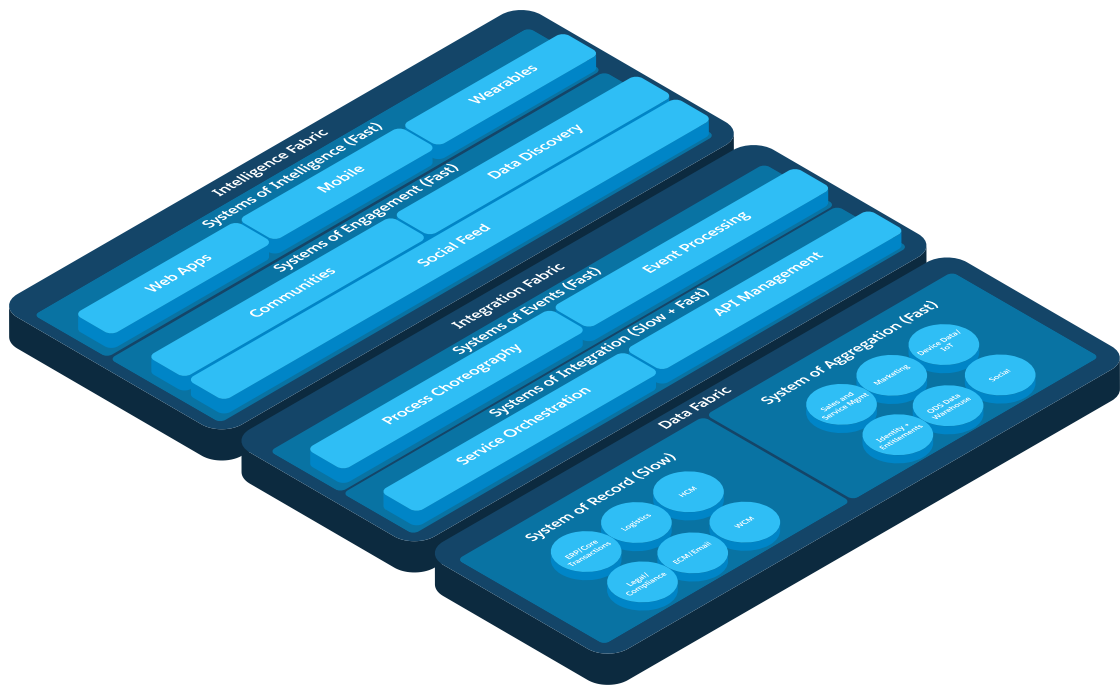
Some of the components are “slow”; that is, they are subject to longer update cycles. In such cases, architects need to plan for less rapid change and reduced agility, but consider ways to unlock the value in these components, including data-by-reference, APIs, and Event-Driven Architectures.

Other components are “fast”, that is, they can be “composed” or deployed rapidly (often in days or weeks). These components are built to be iterated upon (or even discarded) as the LOBs request new features and outcomes.

The fabrics model is designed to start a conversation: it is a way to categorize components and functionality and drive to understanding between Enterprise Architects and LOB stakeholders.

Modern Architects can map their current and planned portfolios to this model, identify integration or process gaps, and then set priority based on the combined Business and IT Roadmap.

What is liberating about Modern Architectures is the Enterprise can realize value immediately, build initial momentum, and accelerate applications and services all while effectively managing budgets.



11. Conclusion

Enterprises preparing to adopt Modern Architectures via fabrics need to understand their internal business operating model, application portfolio, and their own maturity and ability to absorb the types of rapid change and transformation that are being demanded of them.

Thinking through “slow” and “fast” IT with an eye on the future is a great way to create an achievable trajectory for success, built on the Business and IT partnership. We have seen that successful companies’ Enterprise Architects are crucial leaders and facilitators of this partnership.

With over 130,000 customers and 16 years building a massively scalable multitenant cloud app platform, Salesforce has been at the forefront of Modern Architectures, leveraging Enterprise data for connected sales, service, marketing, analytics and mobile apps.

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