

METAVANTE WHITE PAPER

# Achieving Business Success: Why Architecture Matters

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## Introduction

In an environment of increasing competitive pressures, squeezed margins, and a rising bar for meeting customer expectations, financial institutions are continually looking for ways to grow their business while operating as efficiently as possible. To succeed, financial institutions have to be nimble and creative in the ways they apply resources and technology to streamline processes within their organizations, without sacrificing customer service and satisfaction. To achieve this balance, organizations and their technology providers have turned to a variety of technologies to achieve process improvements, gain efficiencies, and enhance the overall experience of employees and customers in performing their day-to-day activities.

## Financial Institutions are Grappling with a Variety of Business Challenges

### HOW WOULD YOU ANSWER THE FOLLOWING QUESTIONS?

- Are your internal processes and internal hand-offs as efficient as they could be?
- Have you optimized and automated end-to-end business processes to drive out costs?
- Are your employees armed with the right information where and when they need it?
- Are you effectively leveraging your delivery channels to provide a differentiated customer experience?
- Have you effectively integrated your disparate systems to fit your business needs?
- Are you making the best use of technology to achieve your business goals?

If you answered no to any of these questions, you'll want to read further for information about how technology and the architecture upon which an organization's enterprise applications are built can add value to your business.

The focus of this paper is less on the technical aspects of architecture, and more on how architectural principles can help you achieve your business objectives. Basically, this report explains why the technology “under the hood” matters, and how it directly impacts your ability to support your customers, make the lives of your employees easier, and reduce overall operational costs. Regardless if the technology within your organization is managed by your organization or has been put in the hands of your technology provider, you may want to critically assess the business value of open architecture, given your background and unique business drivers.

The importance of architecture cannot be overstated. The underlying architecture within your organization directly impacts your ability to quickly adapt and operate efficiently as you grow your organization or respond to new or changing market conditions. Some technology providers offer self-contained, highly integrated solutions that work well when operating within the constraints of the system. Although functionally capable, these systems tend to be difficult to integrate with outside applications and generally are not very scalable as organizations grow.

Other technology providers take a different approach, focusing on building scalable solutions around a set of proven universal architectural principles based on industry best practices. Metavante adheres to these architectural principles when developing and deploying new solutions for financial institutions because they are universal in nature and can be implemented in any organization. These principles are explained in the following pages, along with information about how they can be applied to drive real business value in your organization.

## The Meaning of Architecture

You may be asking, “What do you mean by architecture?” Simply stated, architecture is a distinct set of disciplines used to align information technology with the goals, objectives, and needs of the business.



The architecture discipline, much like all good design concepts, starts with a strong connection with the business in order to drive value. Although many industry consultants can provide guidance, a comprehensive enterprise architecture practice includes the following key disciplines:

- Business architecture – Portrays the business objectives in concepts and high-level approaches to define solutions. Arranges functionality and assigns responsibility to develop comprehensive business solutions.
- Information architecture – Describes the rules, organization, and relationships of data to ensure consistency of definition, use, and availability of information.
- Software technology architecture – Defines the standards, patterns, best practices, and building blocks for the development of solutions.
- Application architecture – Drives the solution characteristics and performance requirements through the solution, and provides the glue, or connection, to overall architecture disciplines.
- Infrastructure architecture – Defines the standards, patterns, and best practices, and provides the blueprint for deployment and execution of solutions.

Conceptually, architecture is a set of disciplines that provides a broad view and unique perspective of the solution definition and design process. Architects are dissimilar to engineers, each having a different perspective. Whereas engineers are deep subject matter experts in a specific application or specialty, architects require a general knowledge of a broad range of topics and the ability to connect long-range plans and trends to deliver a sustaining technology vision and direction. While a single architect may develop the total picture, several engineers perfect the vision. Putting the software development process into the house-building analogy; the architect develops the blueprint and calls out the materials, while plumbers, electricians, heating, and air conditioning specialists engineer the solution.

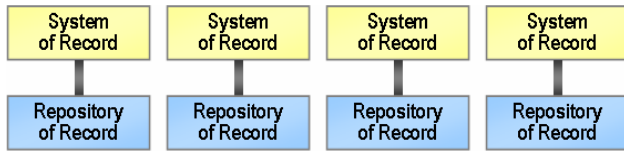
## The Building Blocks

Now that we've defined the meaning of architecture, let's explore the basic tenets and principles that serve as the underpinnings of implementing architecture in an organization. These tenets and principles are relied upon by organizations and their technology providers to deploy and maintain a set of business applications and functions.

## Striving to Store the 'Definitive' Value of Any Piece of Information in One Place

Reliable, timely information is the foundation of most applications and business processes across your enterprise. Employees need access to information to perform their work, whether it's a piece of data, an image, or a document. Building trust in the information provided to employees across your organization, as well as to your customers, is critical to business success. Trust can easily be lost if employees get different or inconsistent answers to the same questions or if they have to rely on stale data or images to make business decisions. As depicted in Figure 1, Metavante recommends that the "definitive version" of every piece of information be stored in only one place, called a *repository of record*, to assure your employees that the information they're getting is reliable and consistent. These repositories are logically tied to applications, often called *systems of record*, that support specific business functions and are tied together to form larger systems. As shown in the figure below, each system of record usually has a corresponding repository of record with data related to the function provided.

FIGURE 1: “ONE ‘DEFINITIVE’ VERSION OF DATA”



In an ideal scenario, every delivery channel would access the repository of record when retrieving data or images. Although we discourage storing the same information in multiple places, this is often not feasible given the multitude of systems and applications spanning your organization. To meet their business objectives, organizations often have to replicate information across different parts of the organization, including applications provided by one or more vendors or service providers and internally deployed systems. These endeavors tend to be time-consuming, expensive, and risky to develop and maintain over time. The implementation of a governing framework that proactively addresses these concerns can add significant business value. If you have a third-party provider, you may want to ask the following questions:

- Do they have a defined approach and process to control replication of data across multiple systems and platforms?
- Do they always strive to update a repository of record that stores only one definitive version of the data?
- Do they control replication of data to other areas within your organization?
- Do they have a way to link replicated data to the source to ensure that they're always synchronized?

## Separating Functions into Distinct, Modular Components

Historically, legacy systems and solutions have tended to be built on large, monolithic architectures that are difficult to adapt to the needs of the business. Modification and integration to these systems are often time-consuming and expensive. In today's world,

organizations must adapt to a dynamic business environment, rapidly evolving trends, and changing customer needs and preferences. The need for agility and flexibility has never been more important. This requirement has led directly to a shift to the implementation of *component-based architecture* models. Simply speaking, this approach is based on having a set of distinct, modular components that can work independently or together cohesively under the hood. This approach is significantly more efficient than building isolated, stand-alone applications that don't talk to each other, work together, or leverage each other to perform common functions. Each component serves a unique purpose and performs a specific, defined function.

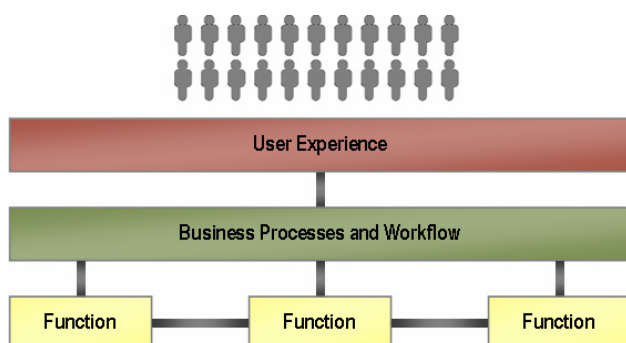
What is the business value of this approach? Because each component serves a distinct purpose, it can be built once and re-used again and again to quickly adapt to changing business conditions without requiring added expense or additional ongoing maintenance. Because components can be loosely coupled, they can more easily be integrated in a flexible, cost-effective manner to meet your evolving business requirements. There are different types of components. Some components are designed to perform specific functions, while others manage business processes and workflows or support the end-user experience. Components are often built to work side-by-side and perform different functions within a larger context. For example, different components can be built to support exception-handling, retirement processing, transfer instructions, or escrow processing.

## Realizing Business Value through Clearly Defined Functional Components

What do we really mean by components when describing a component-based architecture? These examples highlight potential functional enterprise components:

- Centralized customer information to support sophisticated marketing, sales, and servicing efforts across all delivery channels.
- Centralized product definitions and attributes to support consistent product sales and servicing across all delivery channels.
- Centralized organizational definitions and attributes to support consistent performance management, roll-ups, and reporting across the organization.
- Employee sign-on and access to business functions, activities, and data based on their job function or role within the organization.
- Customer authentication to functionality and data provided through self-service delivery channels.
- Centralized capture and storage of images and documents, accessible via an enterprise viewer, or within context of different applications and workflows.
- Centralized warehousing of data across the enterprise to support day-to-day business processes or make better business decisions.
- Centralized storage and management of “work in progress” used to distribute work or start an activity in one location and pick it up in another.
- Consolidated storage, management, and viewing of notes and alerts used to track customer interaction history and trigger follow-up across the enterprise.

**FIGURE 2: COMPONENT-BASED ARCHITECTURE MODEL**



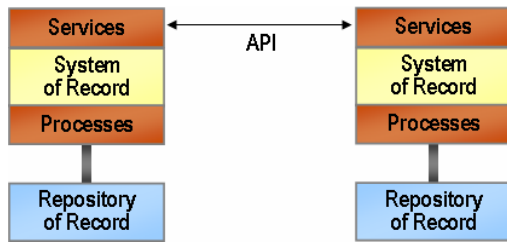
As described in Figure 2, solutions built in this manner can be wired together in different ways to support business process and workflow. Additionally, if a particular function needs to be changed or replaced, only a portion of the solution is affected, minimizing the impact to business processes and workflow.

## Making Information Easily Accessible across Platforms, Systems, and Delivery Channels

It obviously doesn't help to have data stored in different places if it's not easily available to those who need it to make business decisions. It is also very disruptive if disparate applications or technology providers keep the information in their Repository of Record from being shared. This is where another principle comes into play, called *service oriented architecture*, which allows different applications to share data and easily talk to each other. To ensure ease of integration, every solution that maintains a Repository of Record must provide access to that information.

As shown in Figure 3, this is usually accomplished through a set of message-based services, sometimes referred to as *application program interfaces*, or *APIs*, which act as a buffer between applications to send and receive data in a consistent manner that ensures data integrity. Once these services are defined, they can be made accessible to a variety of delivery channels. The advantage of this approach is that by more easily integrating disparate applications, organizations can realize faster development time, lower integration costs, increase business agility, and reduce business risk.

FIGURE 3: SHARING DATA ACROSS SYSTEMS

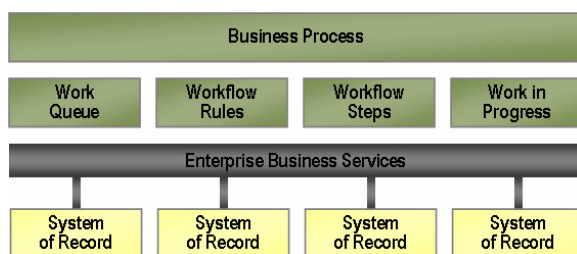


## Tying Different Applications and Business Functions Together into Logical Workflows

Up to now, we’ve described an architecture framework that recommends the separation of business functions into modular components and provided some best practices for storing and retrieving data across the enterprise. You may be asking how all of this is tied together to actually support different business processes within your organization. How do you get all of your different applications to easily work together, while at the same time making the user experience as streamlined and efficient as possible for your employees?

One way to make applications work together in a logical way that is transparent to end users is through the use of *business services*. Business services can be thought of as composite applications designed to accomplish a comprehensive set of tasks necessary to complete a particular business function.

FIGURE 4: SUPPORTING YOUR BUSINESS



## Focusing on the End-User Experience

Developing and implementing solutions that are tailored to meet the needs of different types of users is one of the most critical aspects of the architecture equation. A focus on the end user starts with understanding their day-to-day experience and how they interact with others. A comprehensive user-centered design and testing process ensures that the needs of the user are objectively balanced to deliver solutions that adapt to their behaviors and processes. Additionally this provides the ability to make work efficient and intuitive for the end user.

## What Does it Mean?

### Application Program Interface (API)

The technical specifications for how different isolated applications or components should talk to each other. This is the actual interface that is developed and used to provide business services within an overall service-oriented architecture.

### Business Process Management

The coordination of separate, distinct steps and tasks within a logical, defined process designed to complete an end-to-end business function. This includes specific functions to manage step-by-step workflows, work in progress, and other process-related business rules. For example, workflows may be defined to open accounts, perform servicing functions, or manage sales efforts.

### Business Services

Set of standards governing how applications or components interface and work together to exchange information or perform specific functions.

### Component

A meaningful combination of modular features and functionality assembled to deliver a defined business function. For example, different systems of record

may be used to collect and verify information, create transfer instructions, and execute money movement.

### **Presentation Layer**

The interface presented to end users and customers, used to complete business functions within a defined workflow. Includes all aspects, including signing on to the system, accessing functionality, navigating the system to perform specific activities or tasks, or switching between applications in an elegant manner.

### **Repository of Record**

Sources of information that store discrete data considered the definite version of information across your organization. For example, separate repositories of record may store customer, product, organizational, or security information.

### **Service Oriented Architecture**

Architecture based around self-contained business functions that can be combined and integrated through a set of business services to complete different business processes.

### **Straight-Through Processing**

The end-to-end automation of a business process or function without manual human intervention. May include multiple workflows based on defined business rules, with automated interfaces and hand-offs of data between applications.

### **System of Record**

A meaningful combination of modular components combined to deliver a business application. For example, different systems of record may be used to manage deposit pricing, transfer funds, manage exceptions, or track loan collateral. These systems are often combined to complete major business functions within an organization, such as deposit or loan account servicing.

### **Workflow**

Activities, tasks, and steps required to perform a defined business process. Workflow may include business rules to adapt process based on user inputs

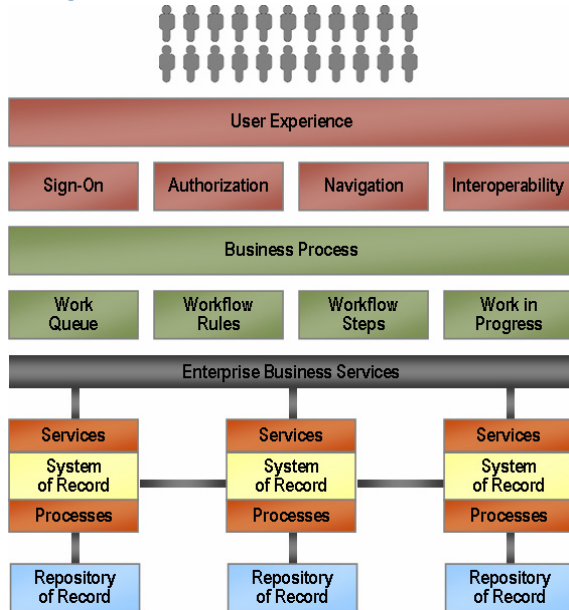
and unique circumstances. It may also include standards for saving work in progress and managing handoffs between different roles or individuals within your organization.

To further customize the user experience, the presentation layer can define the *navigation* or workflow best suited to different roles within your organization. This is based upon the user's role through further detailed definitions within *entitlements*. Depending on their day-to-day work activities, different people may need to see different functions or navigate through a system in different ways. In addition to navigating within an application, an open financial architecture should support the ability to easily move between functional components, or systems of record. This concept, called *interoperability*, lets users perform their work by linking different activities and functions together in a logical way so that users can navigate them in a way that makes sense to them.

## **Tying it All Together**

Let's bring all of this together. Figure 5 shows how all of the pieces fit together to provide a complete architecture foundation for your organization. As you can see, many of the pieces are built on each other, or "layered" in a logical way based on their function. Applications support specific business functions which are tied together to form larger systems. To perform business functions efficiently, end-to-end workflows are defined on top of applications to support the needs of different users and business processes within your organization. The final layer is what is seen and used by your end users on a daily basis. It's the front-end user interface that allows people to sign on, perform specific functions, manage tasks and work queues, and navigate easily between screens or to other applications. If you keep this model in mind when implementing the architectural underpinnings of your business, you will likely be able to meet the changing needs of your customers, while remaining flexible and nimble as you adapt to your changing marketplace.

**FIGURE 5: THE COMPLETE PICTURE**



## Connecting the Dots

Getting back to the questions raised at the beginning of this paper, how does all of this drive business value to help you compete more effectively? A robust architectural framework provides a foundation for cost-effectively and quickly building and integrating products that will meet your business needs, while allowing you to adapt as you grow and react to changes in the marketplace. Although the examples below highlight some of the benefits provided by your underlying architecture, they only represent a few of the ways architecture can be applied to meet your business objectives.

## Improving Customer Sales and Service Across all Delivery Channels

Many organizations are making a significant investment in architecture to implement a comprehensive multi-channel strategy to better service their customers, regardless of how they choose to interact with their financial service provider. Relying

on a set of enterprise components, data, and workflows will allow you to more easily and consistently perform tasks and exchange information across delivery channels.

Storing customer and account information in one location ensures that your customers always receive consistent information when they walk into your branches, contact your call center, use an ATM, or access their accounts through the Internet. For example, by storing an account's available balance in one place, accessible to all of your delivery channels, you can be confident that your customers always get consistent answers to their inquiries.

Furthermore, if a customer decides to update their address information online, and then calls your bank to verify the update, this information would be immediately available to your employees by accessing a centralized repository of contact information.

By separating business functions into separate components, you can use them in different delivery channels. One of the most critical components manages your customer information. Organizations that can capture and manage customer information in a centralized manner are better able to present a complete view of customer relationships including accounts, balances, and transactions from multiple internal and external sources.

You may use another component that lets you define the products that you offer to the marketplace. By leveraging these definitions across multiple delivery channels, you can provide consistency in terminology and a better customer experience.

Are your customers frustrated because the left hand doesn't seem to be aware of what the right hand is doing? Another component can be dedicated to storing a history of your customer interactions and contacts to help your employees provide better service and alert them when certain customer-sensitive conditions arise. This function adds tremendous value in a multi-channel environment, because customer interactions, including manually entered comments and remarks, can be captured in any delivery channel,

consolidated in one place, and made available to any other delivery channel through a set of standard interfaces. For example, if a customer has a negative experience closing a loan, this interaction could be summarized and stored in one location and made available to all of your loan officers, personal bankers, and contact center representatives.

## Supporting Customers Around the Clock and Around the Globe

Given the increased emphasis on anytime, anywhere banking, organizations are making significant architectural investments to support account processing in a real-time (or near real-time), continuously available environment. The ability to access financial information and perform transactions at any time is becoming an increasingly common expectation due to the availability of the Internet and other means to interact with financial institutions in a self-service environment.

Customers are expecting transactions to be completed and funds to be made accessible immediately. As noted above, they also expect this information to be available through all delivery channels, which may drive additional cost to provide around-the-clock support through customer contact centers or via the Internet through Web-based collaboration tools. To support this level of around-the-clock availability, financial institutions are moving toward architectures designed to minimize processing and outage windows, while maximizing access to their systems of record, delivery channels, and business services that support communication between applications.

## Streamlining Business Processes and Workflows to Improve the Employee Experience

Perhaps the greatest benefit gained by implementing an open architecture is the ability to define, automate, and streamline workflows and business processes across applications to optimize efficiency and reduce expense. Traditionally, organizations have been constrained by processes that tend to be manual, labor-intensive, and unique to each department within the bank. Business process management and workflow tools, when implemented upon a component-based, service-oriented architecture, can add tremendous value by maximizing the efficiency of employees who engage in repeatable tasks.

The goals of most business process improvement efforts focus on making processes more intuitive, reducing the complexity of navigating multiple systems, eliminating re-keying of data between systems, reducing manual steps, performing clean hand-offs of work between employees, and eliminating the creation, routing, and storage of paper. In simple terms, organizations are basically trying to automate as much as possible, and if that doesn't work, make processes simple and easy to follow. If done well, these efforts can make employees more productive, while becoming more responsive to customers.

In the retail banking space, many of today's leading platform solutions are moving toward the implementation of business process management engines to help employees manage the workflow of opening accounts in a logical and efficient manner. Employees want to be able to open accounts quickly and intuitively without having to enter information multiple times. All activities and tasks are presented to users in an easy-to-follow, step-by-step approach that allows organizations to configure the workflow to optimize efficiencies given their unique preferences and needs. This approach enables organizations to

reduce the time required to educate employees, service customers, and manage their daily work.

## Implementing End-to-End Automation and Straight-Through Processing

In addition to streamlining and simplifying workflows, organizations want to automate business processes by eliminating as much human intervention as possible. This concept, called straight-through processing, is a common goal for organizations looking to reduce the cost of supporting customers while increasing efficiency. Having a flexible, open architecture greatly helps when trying to implement automated, end-to-end processes.

One example of straight-through processing is the immediate fulfillment of service requests. Financial institutions can increase customer satisfaction and reduce support costs by empowering their customers to perform servicing activities through self-service channels in an automated, straight-through manner. Customers could view and update personal information, perform account maintenance, and request and receive information through the delivery channel of their choice without human intervention. Supporting the streamlined capture, upload, and real-time fulfillment of customer requests requires a highly available architecture that integrates multiple disparate components in a flexible manner.

Another example of straight-through processing is the recent trend that encourages consumers to open and fund deposit accounts through the Internet. This process usually involves a number of steps to present available products to consumers, capture applicant information, verify the identity of the applicant, specify initial funding accounts, verify the ownership of funding accounts, initiate funding transactions, create the deposit account, upload the account, and enroll the customer in an Internet banking application for servicing the account. As you can tell, this process involves the capture and smooth exchange of data

between multiple functions with discrete purposes throughout the process. Ideally, this process should be very easy to follow in a step-by-step manner, allowing applicants to open their new accounts in a single session. Again, the value of a component-based approach tying together disparate functions through a common workflow can go a long way when executing this business strategy.

## Managing Security and Reducing Risk

Given the increased scrutiny on preventing identity theft and fraud, organizations are taking an enterprise approach to risk management. From an architectural perspective, unique components can be implemented across the organization to centrally manage information security and the identity and access management of customers and employees.

A logical enterprise component within any architecture is a function that authenticates the identity of customers as they interact with your organization through a variety of delivery channels. Once in place, customers could be authenticated consistently against a centralized repository of credentials and authorized when they want to open new accounts, log in to service their existing accounts, or perform high-risk transactions. From an employee perspective, organizations could leverage the same credentials repository to authenticate the identity of different end users and authorize access to specific functions and data based on the specific activities they need to perform.

Fundamentally, a component-based architecture also helps organizations isolate and reduce operational risk. By making everything modular, changes to a component can be made without impacting other components or functions downstream. This directly results in less risk and testing required when introducing new features or making changes to applications. Components that are re-used also tend to have proven stability and scalability.

## Conclusion

The role of enterprise architecture within your organization can be a key contributor to your ongoing business success. As you evaluate the state of your business, you may want to assess your underlying architecture and ask how it could be better applied to drive business value.

- Do you or your technology provider adhere to a set of architectural best practices or principles?
- Do you or your technology provider apply these best practices or principles within a defined architectural framework?
- Do you or your technology provider have a vision for evolving your architecture to meet your changing business needs and market conditions?
- Do you have a good understanding of how your architecture is being applied to drive business value?

As you consider the answers to these questions, keep in mind the potential of enterprise architecture in increasing operational efficiency, reducing development and integration costs, improving the experience of your customers and employees, and reducing risk across your organization. Perhaps most importantly, consider the positive financial impact and competitive advantage a robust architectural framework can provide. In today's tough marketplace, that may make quite a difference.

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