INTEGRATE, INNOVATE & ACCELERATE

SYSTEM INTEGRATION: SIMPLIFYING COMPLEX SYSTEM INTEGRATION ORCHESTRATION

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INTRODUCTION

Integrating and streamlining multiple systems within two or more technology environments to form one all-encompassing and optimally coordinated functional solution is a key challenge in a post-merger or acquisition scenario.

Orchestrating such a complex process typically utilizes a variety of techniques, including Enterprise Application Integration, business process engineering, or software development. Such technologies and techniques should always aim to enhance value by optimizing costs and expediting time to market. Fortunately, more and more systems are designed to be integrated, connected, and customized.

Whether it is driven by a merger or an acquisition – or indeed a smaller scale modernization program, transformation initiative, or digitalization project – the key objective of system integration remains the same. That is, to ensure disparate systems can communicate seamlessly with minimal manual intervention, to enhance the speed of information flow across business units, and to reduce operational costs and risks.

One way or another, it allows faster decision-making as data is no longer scattered across technology silos, and analytics can be performed via a centralized repository with a holistic view of all information in order to more effectively extract useful business insights.

A key consideration is that ideally you will need to freeze your system state during key phases of the integration to avoid working against a moving target. However, business and regulatory imperatives will often make this difficult, if not impossible, and a 'twin track' approach may be required.

RECOMMENDATION

Isolate the 'pure' system integration work from other activities but embed it carefully within the overall program/initiative context by establishing a clear governance, program organization, and project milestones interlinked between all activities.

Of course, when system integration occurs in the context of a merger and acquisition, specific additional challenges – such as legal entity union, regulatory clarifications, rebranding activities, identification of synergies, stabilization of the business, and organizational transition elements **including people culture** – increase the complexity of a system integration project and must accordingly be high on the planning agenda.

1. EVOLVING APPROACHES TO SYSTEM INTEGRATION

Go back 25 years, and system integrations were typically performed within narrow 'functional silos'. This evolved into a more flexible approach where functional systems were connected to one another to achieve an 'interconnected integration', offering greater flexibility when replacing individual systems with newer ones over time.

However, the replacement of such systems carried immense costs. The initial answer was **Enterprise Service Bus (ESB)**, an integration approach in which the ESB serves as an interface for translation of data (in terms of structure and format) between connected systems.

As data has come to play an ever more important role in recent years, a common data approach was a logical evolution to eliminate the need to translate many different formats, and this arrived in the form of **Enterprise Application Integration (EAI)**, which essentially provides a data transformation service between system-specific and common formats.

EAI is a broad term that refers to the techniques and technologies used to integrate different enterprise applications and coordinate data and processes between them. EAI can encompass a variety of technologies and approaches, including data integration, process integration, and service-oriented architecture (SOA).

EAI is typically focused on the integration of large, complex enterprise systems and can include integration of systems within an enterprise as well as integration with external partners and service providers within its own enterprise context.

A more recent innovation is the **API gateway**, a specific technology often used in microservice architectures. An API gateway acts as a central access point that forwards incoming requests to the appropriate backend services. It provides functions such as routing, authentication, rate limiting, and protocol translation. An API gateway is typically focused on providing a unified API interface for a variety of smaller, independent services that are sourced both internally and externally.

2. EAI AND API GATEWAYS: A DEEPER DIVE

EAI is a framework that connects various applications, systems, and services within an enterprise to streamline business processes and enable seamless communication. EAI can use various technologies and methodologies, including middleware, message queues,web services and more. EAI can be used to integrate internal systems as well as connecting to external systems. For example, a company might use EAI to connect its CRM, ERP, and accounting systems, or to connect to an external supplier or partner system.

The main functions of EAI are data integration (ensuring that data is consistent between systems), process integration (connecting business processes across different systems), and business function integration (enabling the sharing of functions between different business applications).

An API gateway is a server that serves as an API front-end and routes incoming API requests to the appropriate back-end services. API gateways provide features such as request routing, API versioning, API security, load balancing and more. API gateways can be used for both internal and external APIs. Internally, they can be used to manage microservices in a microservice architecture. Externally, they can be used to provide APIs to third parties such as partners, developers, or other companies. API gateways tend to be less comprehensive than EAI in terms of integrating business processes and functions, but they provide specific functionality for managing APIs, especially in microservice architectures.

RECOMMENDATION

EAI and API gateways are both used to connect systems and applications, but they do so in different ways and are used in different contexts. EAI is typically more comprehensive and used for complex integration scenarios, while API gateways are used specifically for managing APIs, especially in microservice architectures.

3. PARALLEL USE OF EAI AND API GATEWAYS IN SYSTEM INTEGRATIONS

It can make sense for an organization to adopt both EAI and API gateways, especially if it has a variety of internal and external systems and services that need to be integrated. Below are some scenarios where the usage of both technologies can make sense:

- **Complex internal system integration**
  EAI can be used to integrate a variety of internal systems, including legacy systems and applications that may not have modern APIs. EAI can also be used to integrate complex business processes that span multiple systems and applications.
- **Microservice architectures**
  If an organization uses a microservice architecture, an API gateway can be used to manage interaction with microservices. The API gateway can serve as a central access point that routes incoming requests to the appropriate microservices.
- **External API integration**
  An API gateway can be used to provide APIs to external users, such as partner companies, developers, or customers. The API gateway can provide functions such as authentication, rate limiting, and protocol translation.
- **Hybrid cloud scenarios**
  In situations where an organization uses both on-premise systems and cloud-based services, EAI could be used to integrate the on-premise systems, while an API gateway could be used to manage interaction with the cloud services.
- **B2B integration**
  Companies that do business with numerous partners can use EAI to connect their internal systems with their partners' systems. API gateways can serve as a secure interface for partners to access specific data or services.
- **Mobile and web applications**
  API gateways are particularly useful when organizations deploy mobile or web applications that need to access backend services. The gateway can serve as a central point to manage and route requests, and can provide features such as authentication, caching, and rate limiting.
- **Internet of Things (IoT)**
  In IoT scenarios where a variety of devices and services need to communicate with each other, API gateways can be used to manage and secure communications. EAI can be used to integrate the data generated by IoT devices with enterprise systems.
- **Legacy system integration**
  Many enterprises have legacy systems that support key business functions but lack modern APIs. EAI can be used to integrate these systems with the rest of the IT landscape.

These are just a few examples of the many ways EAI and API gateways can be used.

RECOMMENDATION

It is important to note that the decision of whether and how to use EAI and API gateways depends on the specific requirements and circumstances of the enterprise. It is also important to consider the potential costs and complexities associated with using these technologies.

4. WHAT TO CONSIDER WHEN USING EAI AND API GATEWAYS IN PARALLEL

When EAI and API gateways are used together, the following factors are important to consider to avoid conflict.

- **Purpose of use**
  EAI and API gateways have different functions and should be used accordingly. EAI is typically responsible for integrating internal systems and applications, while API serves as the interface for external requests. It is important to clearly define and understand these functions to consider and avoid conflict.
- **Security**
  Both EAI and API gateways have important roles to play in ensuring the security of an organization's data and applications. It is key that both are properly configured to minimize security risks. This may include the use of authentication, encryption, rate limiting and other security measures.
- **Performance and scalability**
  EAI and API gateways can both have a significant impact on the performance and scalability of an organization's systems and applications. It is important to ensure that both the EAI solution and the API gateway are configured to deliver the required performance and scale as needed.
- **Error handling and recovery**
  Both EAI and API gateways should be able to effectively handle errors and provide rapid recovery when needed. This may include the use of techniques such as retry logic, fallback strategies, and other recovery mechanisms.
- **Monitoring and logging**
  It is important to effectively monitor and log both the EAI solution and the API gateway to quickly identify and resolve issues. This may include the use of monitoring tools, log analysis tools, and other technologies.

RECOMMENDATION

It is important that these two technologies work together effectively to ensure the best possible integration and interoperability of an organization's systems and applications. In merger & acquisition scenarios we always recommend not to mix concepts within the same functional domain or work stream. While EAI might make sense when it comes to static data management, API gateways might be considered for integrating payment platforms. Decisions should be taken one by one considering all relevant functional and technical aspects.

At Capco, we are familiar with integrating various functional and technical systems, applying simplified techniques to deploy a perfect coordinated client solution addressing exact client needs and requirements.

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