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# Enterprise Systems Integration

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## Introduction

# Outline

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- ▶ Enterprise integration definition
- ▶ Importance of enterprise integration
- ▶ Challenges in Enterprise Integration
- ▶ Types of integration
- ▶ Different approaches to application integration
- ▶ Data integration

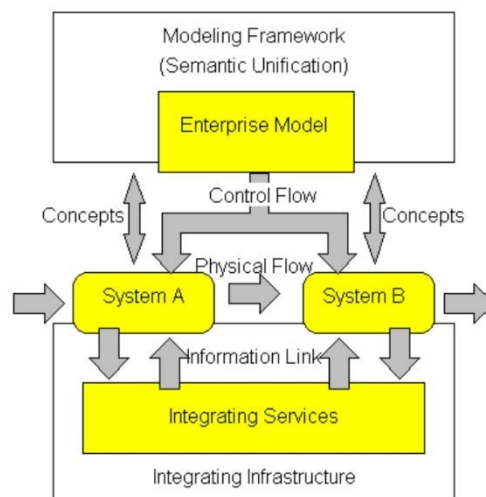
## Enterprise integration overview

- ▶ Most enterprises have a burgeoning array of diverse applications, devices, clouds, and networks, not to mention exponentially growing volumes of data. Given the complexity, how can they react quickly to and meet ever-shifting customer demands? How do they stay responsive, resilient – and profitable? The answer lies in enterprise integration [1].

# Enterprise integration definition

- ▶ **Enterprise integration (EI)** refers to the process of ensuring that all the software applications and systems within an organization work together seamlessly. It involves linking different computing systems and software applications to act as a coordinated whole.
- ▶ **EI** is the practice of connecting business applications, data, private and public clouds, processes, devices – and of course, people – across the entire IT landscape.

# Enterprise integration definition



## Why is enterprise integration important?

- ▶ EI makes it possible for different systems and data sources to seamlessly share information with each other. It allows data to flow across the organization in real time.
- ▶ The **key business benefits of EI** include:
  - Optimized and automated business processes.** With EI, companies can connect, optimize, and automate processes across the organization

## Why is enterprise integration important?

- ▶ The **key business benefits of EI** include:
  - Better customer insight.** With EI, businesses can connect and interpret all types of information to gain a 360-degree view of their customers and audiences, and ensure compliance with privacy regulations.
  - Futureproofed IT landscape.** EI can merge legacy systems with newer cloud technologies.

# Why is enterprise integration important?

- ▶ The **key business benefits of EI** include:

**Enhances Efficiency:** By integrating disparate systems, organizations can streamline processes, reduce redundancy, and improve operational efficiency.

**Improves Data Accuracy:** Integration ensures that data is consistent across all systems, reducing errors and ensuring that all departments have access to the same information.

**Supports Growth:** As organizations expand, integration allows for the scalable addition of new systems and applications without disrupting existing workflows.

## The Need for Enterprise Integration

- ▶ **Legacy Systems:** Many organizations still rely on older, legacy systems that were not designed to work with modern applications. Integration allows these legacy systems to communicate with newer technologies.
- ▶ **Heterogeneous Environments:** Organizations often use a variety of software applications from different vendors. These systems need to work together to provide a seamless user experience.
- ▶ **Data Silos:** Data stored in isolated systems (data silos) can create inefficiencies. Enterprise integration helps to break down these silos, allowing data to flow freely between systems.



# Challenges in Enterprise Integration

- ▶ **Complexity:** Integrating multiple systems can be complex, especially when dealing with legacy systems, different data formats, and varying protocols.
- ▶ **Security:** Ensuring secure communication between integrated systems is critical. This involves managing authentication, authorization, and data encryption.
- ▶ **Scalability:** As organizations grow, their integration needs can become more complex. Ensuring that the integration architecture can scale to meet future demands is a significant challenge..

## Types of integration

- ▶ There are a number of different types of integration connecting critical systems, processes, data, and applications across all lines of business within an organization.
- ▶ **Application integration.**
- ▶ **Data integration.**
- ▶ **User Integration:** Involves creating a unified user interface across different applications, enabling users to access all necessary tools and data from a single platform.

## Types of integration

- ▶ **Platform integration:** With platform integration, a comprehensive set of software products enables IT professionals to develop secure integration flows that connect and govern disparate applications, systems, services, and data sources in the cloud. Platform integration is also closely related to integrated platform as a service (iPaaS).
- ▶ **Device integration:** With device integration, different devices are connected so they can communicate, interact, and interoperate to support business needs and drive productivity.

## What is application integration?

- ▶ Most companies – even small and midsize ones – use over 200 applications, each designed for its own specific purpose. But these applications don't always talk to each other, creating a whole host of problems: incomplete information, errors, contradictions, and delays.
- ▶ **Application integration** is the process of connecting independently designed software applications so they work together and share information in real time.

# Different approaches to application integration

- **Enterprise application integration (EAI)** was accomplished in one of two ways:

- 1. **Point-to-point (ad-hoc) model**

It means that each application has to be customized to connect to the other applications.

This is a tedious work and highly error-prone. This model can be very hard to maintain over time.



# Different approaches to application integration

- 2. **Hub-and-spoke (orchestrator) model - Enterprise service bus (ESB)**

To solve these problems, the connections between applications are handled by an orchestrator- the hub.

All integration is, by design, dependent on the hub to function.





## Different approaches to application integration

### 2. Hub-and-spoke (orchestrator) model - Enterprise service bus (ESB)

ESB is an architectural pattern whereby a centralized software component performs integrations between applications. ESB is the most common type of EAI.

ESB is a middleware solutions that are used primarily to integrate legacy and on-premises applications – they are not usually used to connect cloud-native apps.

**Middleware:** is software that acts as an intermediary between different apps or systems, enabling them to communicate and work together. It provides services such as message queuing, transaction processing, and security.

## Different approaches to application integration

### 3. Integration Platform-as-a-Service (iPaaS):

The most modern approach to application integration is iPaaS.

An iPaaS is a cloud-based service that integrates applications, data, and processes – usually in a simple and automated way.

With an iPaaS, you can build integrations between cloud and on-premises apps using APIs.

A combination of messaging, application connectors, data streams, enterprise integration patterns, and APIs that can be deployed faster and iteratively are more suited to modern application development.

# What is data integration?

- ▶ **Data integration** is a set of practices, tools, and architectural procedures that allow companies to consume, combine, and leverage all types of data.
- ▶ Data integration takes data from different sources and cleanses, formats, and combines it into one data set that can be used to fuel analytics and business insights.

## How does data integration work?



- ▶ After the information is integrated, data analysis is carried out, providing business users with information they need to make informed decisions.

## Questions

- ▶ What is the primary goal of Enterprise Integration?
  - A. To replace all legacy systems with new software
  - B. To ensure that all systems within an organization work together seamlessly
  - C. To reduce the number of employees in an organization
  - D. To outsource IT operations to third-party vendors

## Questions

- ▶ Which integration pattern involves directly connecting two systems?
  - A. Hub-and-Spoke
  - B. ESB
  - C. Point-to-Point
  - D. Microservices

## Questions

- ▶ Which of the following is a challenge associated with enterprise integration?
  - A. Elimination of data redundancy by default
  - B. Enhanced system security without additional effort
  - C. Scalability concerns as the organization grows

## Questions

- ▶ Which integration pattern is characterized by using a centralized bus to manage communication, transformation, and routing?
  - A. ESB
  - B. Point-to-Point
  - C. Microservices

## Questions

- ▶ True or False: Data silos improve the efficiency of data sharing and integration within an organization.
- ▶ True or False: Scalability is not a concern in enterprise integration since modern systems are inherently scalable.
- ▶ True or False: In Hub-and-Spoke Integration, the central hub can become a single point of failure, which is a potential risk
- ▶ True or False: Enterprise Integration primarily aims to reduce the number of software applications within an organization

Thank you