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A Survey on Integration of Applications - Tools, Types & It's Challenges

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Abstract

Application integration services allow a variety of apps inside a company to share processes and business data. enabling the transformation and orchestration of the data necessary for business activities by integrating a number of assumptions and cloud apps. The program that integrates and improves the data transfer between two different software applications is called application integration. Businesses frequently use this software to build a bridge between an older on-premises application and a new cloud-based one, allowing the two systems to coexist. This article will describe application integration, its software and varieties, and the many actions that may be taken to implement application integration strategies.

Keywords: Cloud Applications, Application Integration, Business Activities, ERP, CRM

1. Introduction

Application integration services allow for the exchange of business processes and data inside a company. Connecting several cloud apps is necessary to change the data needed for business activities. These programs cover a variety of business requirements, including those for finance and enterprise resource planning (ERP) systems, e-commerce, and customer relationship management (CRM) platforms. The systems are essential for providing a thorough method for typical commercial operations that demand numerous technological inputs and generate income. Open communication mechanisms and the elimination of data that slows down business processes are features of the integration technology that links SaaS and specific apps with enterprise architecture [1].

Figure 1. Uses of Application Integration [2]

Depending on the use case, data pattern, and application integration tools at hand, which play a significant part in the integration of applications, application integration technologies might differ per firm. The enterprise application integration approach combines technology and services to transmit relevant data among some of the application software and IT systems that run businesses, whether it be one-time application data, two-way synchronization, or on-demand data processing. On-premises application integration, Saas application integration, and application-to-application integration are a few types of application integration.

The majority of the time, application integration reduces data redundancy and enhances data quality by guaranteeing that there are no inconsistent multiple copies of the same data [3]. A well-implemented application-integrated solution can offer a number of business advantages, including increased productivity, which allows staff to spend more time using data to support business goals; better scalability, which allows for faster, deeper, and more robust integrations; and decreased cost, which eliminates the need for manual integration management and the associated time and expense. Easier adoption of new technology that enables cutting-edge innovations that help businesses get more value from their data.

Services for application integration are frequently employed across a variety of business domains. Consultation with the workforce based on their requirements and objectives in terms of business, identification of the parameters and potential of the integration project, and advice on the design, approach, as well as software for the IT infrastructure [4]. Choosing the best integration strategy requires considering the solution design, requirement management, and risk

assessment. Web services, messaging from services-oriented architectures (SOAs), object request brokers (ORB), remote procedure calls (RPC), and publishing subscription-based communication integration are all examples of platform integrations. Data transformation provides the platforms and methods for extracting, transforming, and manipulating data for clients on enterprise IT platforms like.NET and Java EE.

Users may simply and quickly obtain the required information thanks to portal integration, which presents integration gathered from several apps on a single user integration. Using the component architecture of the SOAP/XML framework, component integration comprises integration at the level of business logic, transaction management, and application. Building web service adapters or creating custom adapters on the right middleware are examples of application integration services. Process integration is a business process management (BPM)-based methodology that involves modeling processes and workflows.

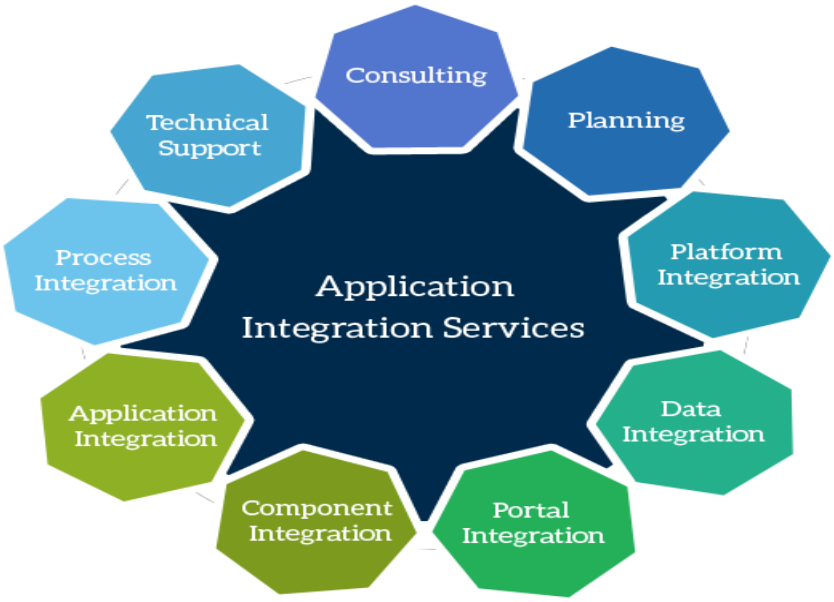

Figure 2. Applications of Integration Services [4]

2. Integration Application Tools

There are many different tools available for integrating applications. They concentrate on three distinct elements: flexibility, integration outside the cloud, and connectivity to other destinations. -Oracle Applications, IBM MQSeries, Microsoft Biz Talk Server, Tibco, and Talend are a few of the most prominent integration application technologies. [5].

Table 1. Application Integration Tools

Tools	Uses
IBM MQSeries	It is a tool for corporate applications. It functions with a variety of computer systems, applications, web service frameworks, and communication protocols.
Microsoft Biz Talk Server	It aids enterprises in building multilingual communication and streamlining business procedures. For big businesses, Biz Talk provides tools that aid in the development, implementation, deployment, and management of business processes.
Oracle Fusion	One of the most comprehensive and integrated application integration tools is this one. It strives to sustain teams' ongoing development, monitoring, and process improvement. This solution has the ability to be modular, allowing an organisation to install, configure, and only utilize the services that they require.
Tibco Software	It offers the most cutting-edge business process management capabilities available in application integration services. These tools are frequently used in heterogeneous application systems to integrate.
Talend	Other tools included in it are Talend Data Fabric & Talend Data Integration. The open-source integration technologies aid in increasing operational agility for businesses. Its straightforward GUI enables developers to build, test, and distribute application services rapidly.

Figure 3. Tools of Integration Applications

2.1 Types of Integration Application

Application Integration has four standard levels. They are presentation-level integration, business process integration, data integration and communication-level integration. These four levels are overlapping technologies that are used together to create a complete application integration solution connecting new applications with existing ones [6].

2.1.1 Presentation-Level Integration

Integration at the presentation level unites a jumble of several programs into a single application. It is one of the earliest and is sometimes referred to as "screen scraping" since it involves utilising conventional software to gather and arrange data. Presentation level integration offers an improvised but less-than-ideal method for information integration and access by establishing a virtual intermediary to gather the data and transmit it to each of the apps.

2.1.2 Business Process Integration

Business process integration (BPI) is a crucial procedure that links systems and information in the business environment efficiently. BPI software was previously only accessible to major commercial firms with the financial means to purchase it. The requirement for an effective integration solution that optimised operations between marketing, sales, customer service and support, supply chain management, etc., however, has led to their application in enterprises of all sizes today [7]. For Ex. Mulesoft provides a business process integration solution. Mule is a simple integration platform that integrates many applications and services. It

is an enterprise service bus. Additionally, it makes data and technology integration rapid and reliable.

2.1.3 Data Integration

Data integration is the method of obtaining data from several sources and bringing it together for consumers to see. It is utilized to make data more easily accessible, digestible, and processable for people and systems. Data integration may increase data quality, free up resources, save IT expenses, and encourage creativity [8]. Companies may boost operational efficiency by adopting data integration to reduce the need to physically transform and merge data sources, which is one of the major benefits. improved data quality through automated data transformations used in accordance with business regulations. Extract, Transform, and Load (ETL) is a typical data integration approach in which data is physically taken from several source systems, converted into different data formats, and imported into a centralized data storage.

2.1.4 Communication-Level Integration

Data integration and business process integration are specifically accomplished using a mechanism called communication level integration. The communication level integration would decide whether to write, dance, sing, or read if data integration is the foundation of human integration. Application Programming Interfaces (APIs), specialised protocols, are used to make sure that each application receives information that is intelligible and transmits the information to others in a clear and helpful way. Additionally, this connection makes use of various middleware, including point-to-point, hub-and-spoke, and Enterprise Service Bus, to assist data transformation inside the integration platforms (ESB). Applications can receive and send requests and responses directly via point-to-point communication. Centralized middleware is used by Hub and Spoke to manage data transformation and properly route information.

Table 2. Application Integration - Types

Types	Uses
Presentation-Level Integration	Combining many apps into a single one. Also known as "Screen Scraping," this process of gathering and organizing data.

	It offers less-than-ideal access and integration methods for data.
Business Process Integration	It connects corporate operations to on-premises and cloud servers, which lowers mistakes and removes obstacles. It makes investments in the powers of artificial intelligence and automation to increase the effectiveness of applications.
Data Integration	It involves apps sharing information in a transparent manner. Efficiency, precision, and efficacy would suffer without this strategy. Data transformation is referred to as the primary corporate application integration solution.
Communication-Level Integration	This technique was developed to integrate corporate processes and data. Program Programming Interfaces (API) are specialised protocols that guarantee each application can understand the information it receives and may transfer it in a straightforward manner to others. Within the integration platform, many middleware techniques are employed, including hub-and-spoke, enterprise service bus, and point-to-point (ESB).

3. Challenges and Benefits

Without the proper integration platform, businesses would struggle to maintain a custom-coded, non-scalable application environment. The administration of data is extensive in new ERP, TMS, WMS, and other applications. There are siloed applications, laborious integrations, and no automation systems. Applications launched separately and the enterprise's core include

data that might contain insights connected to data. Thus, the captive is in a compartmented area of the company. Integrations increase the time needed to onboard users and consume a program that needs specialised maintenance capabilities. Organizations lacking the ability to map and transform data cannot receive or route partner data effectively.

Faster GTM, process automation, concurrent processing, visibility, and scalability are some advantages of application integrations. Delays in technology adoption prevent companies from realising a faster ROI. Applications enable connections to easily launch a new system and generate a profit. To enhance efficiency and automation, a top-tier application integration platform will provide smooth data in a range of systems and workflows. Concurrent processing is the simultaneous execution of several processes that perform comparable tasks. Application integration makes it possible for companies to fully integrate from beginning to finish and enhances visibility for viewing, tracking, and reporting throughout the workflow.

4. Future Enhancements

Future integration will be able to explain itself in a flexible manner, and artificial intelligence will be employed to dynamically separate integration consumers in response to changes. Privacy and data security will fall disproportionately on integration providers. This will motivate investors to make security and privacy investments, to support novel data protection techniques, and to see data privacy as an essential component of the future [9]. Because of the next adaptive, intelligent integration technologies, integration will be dispersed. Due to the spread of integration knowledge, it will be decentralized.

5. Conclusion

These scenarios each show how application integration functions as intended and effectively as possible. Nobody wants to learn about ERP and CRM development, as prebuilt application connectors are used to build business value. The external and internal B2B integration software activities are fully visible and enabled through application connections. The above-mentioned features are offered by the application integration solution. These solutions are also built to be simply adaptable, and they automatically update to the relevant data formats across the technologies. This review article discussed integration applications, kinds, various tools, future scope, difficulties, and advantages.

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