INTEGRATING
PEOPLE, PROCESSES & TECHNOLOGY

TEKMINDZ™

Understanding Application Integration

Application integration requirements come from many sources, from traditional on-premises to cloud services. And although many application integration solutions are available, aligning the correct technology with the business' overall strategic objective is often a major challenge for enterprises. Application integration requirements are continuing to expand to a much broader and wider spectrum. New technologies of social networks, mobile devices, and analytics have further added to the complexity. Further, as applications move from on-premises to cloud services, CIOs, CTOs and IT leaders face the challenge of getting the right application integration project in place that align with their business' strategic roadmaps..

Approaching your Integration Project

Identifying and selecting the correct approach for your application integration project is a complicated task. With over a dozen types of integration products and services available the right choice for integration is massively influenced by a wide range of commercial and technical criteria. The right approach to integration should address the critical challenge of avoiding the problems associated with inconsistency of data or fragmentation of business processing. The wrong choice can potentially result in increased cost of carrying out the integration project and ultimately cause business disruptions by failing to meet the organizational objectives. To address this critical challenge, CIOs, CTOs, Application Managers and other IT leaders are required to select the right integration approach that best fits their organizational objectives.

Choosing the Right Solution for Your Application Integration Project

Choosing the best solution for an integration project requires Application managers, (SaaS) managers, (SOA) architects, Integration managers and other IT decision makers (DMs) to consider an array of commercial and technical evaluation criteria. The first step that applications managers must take to is to identify the broad approaches to an application integration project.

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Executing Your Application Integration Project

To simplify the process, identify the four basic approaches1 for implementing integration projects:

1. **Point-to-Point Integration Architecture:** Pair-wise integration between two systems using custom code (e.g., for interface logic into and out of the systems, and for transformation of data, transactions or records) and basic file transfer, message-oriented middleware (MOM), database replication or other communication middleware.
2. **On-Premises Integration Middleware:** Commercial off-the-shelf (COTS) integration middleware software for implementing one or more projects.
3. **iPaaS:** Cloud-delivered integration functionality for implementing integration projects.
4. **Integration Brokerage:** The outsourcing of one-time integration project implementation and ongoing management.

Each of the four approaches to an application integration project can be commercially feasible and consolidating all integration projects into one approach could very well be the ideal choice for certain integration projects. However, choosing one approach or a combination of two or more approaches would entirely depend on the organizational objective.
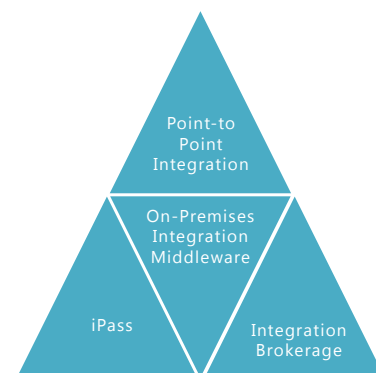
Approaches for Application Integration projects:

1. Gartner for Business Leaders: ''How to Identify the Right Basic Approach for Your Application Integration Project''; Beyer Lheureux, J., B., Pezzini M., Thompson, J., Malinverno, P., May 31, 2012.

The following scenarios describe the four approaches, the advantages and the challenges associated with each, to help enterprises identify and select the best-fit approach for their application integration project.

Again, business may choose one approach and consolidate all their integration projects into it, or choose a combination of two or more approaches. The choice should address their overall organizational objective.

Point-to-Point Integration				
Description	Attributes	Benefits	Challenges	Best-fit
Point-to-Point Integration is the simplest and most common approach to integrating any combination of application Systems, trading partners or cloud (SaaS) APIs. Typically, this involves developing a custom interface to extract data from the source and to transform data as required. In many projects, data is simply output as an ASCII file for transfer to the target, where it can be input using another custom interface. Other projects use REST, SOAP or a proprietary MOM protocol to exchange data between the source and target.	Potentially, each integration interface is developed using a different technology or platform. User organization, or System Integrator (SI), is responsible for interface development / testing, ongoing maintenance and operations.	Does not require COTS integration middleware. Implemented for each interface using the most suitable approach. Appropriate for isolated integration projects.	Can escalate development and maintenance costs as the number of interfaces grows. Difficult to operationally monitor and manage. Difficult to instrument (e.g., for business activity monitoring). Difficult to govern (maintain, upgrade and change).	Your project's center of gravity is integrating applications that you control. You need to implement only up to four or five interfaces. You are unlikely to use the interfaces you develop in other integration projects. The project has a short life cycle (e.g., less than three years). There is a strong desire to avoid implementing COTS integration middleware.

On-Premises Integration Middleware

Description	Attributes	Benefits	Challenges	Best-fit
Integration middleware includes stand-alone point solutions for enterprise service bus (ESB), data Integration B2B gateway software (BGS) or managed file transfer (MFT), as well as suites that can combine all these capabilities into one solution. Many organizations have spent substantial amounts of time and money laying down an enterprise integration/SOA infrastructure and establishing an integration competency center or an SOA center of excellence, to implement and manage integration projects. The reasons are that integration middleware is mature, widely available, delivers value to companies seeking to manage costs by improving integration project maintainability, and provides a consistent infrastructure and approach for improved manageability, governance and business activity monitoring.	Integration interfaces are developed using some form of on-premises commercial ESB, BGS, MFT or data integration middleware. The user organization (or SI) is in charge of interface development /testing, ongoing maintenance and operations.	Provides a familiar approach (especially in midsize and large organizations). Leverages mature and widely deployed integration middleware. Features strong monitoring, management and governance capabilities. Incorporates much of the integration logic in metadata and rendered graphically using data mapping, modeling and/or orchestration tools. Enables the infrastructure to support business activity monitoring.	Integration product and "big bus" integration project is complex and expensive. Sophisticated, potentially expensive and hard-to-find skills (not many IT graduates are skilled in Middleware technologies) are required. Few integration middleware products offer a full suite of adapters for all applications, B2B protocols and SaaS APIs.	Your project's center of gravity is on-premises or B2B/e-commerce integration, but also involves some SaaS integration. You prefer to fund your project using capital vs. operational expenses (e.g., for software and developers). You have a strong desire to control all aspects of your integration project, commercially and technically. You have, or are willing to invest in, specialized integration middleware and the skills necessary to use it.

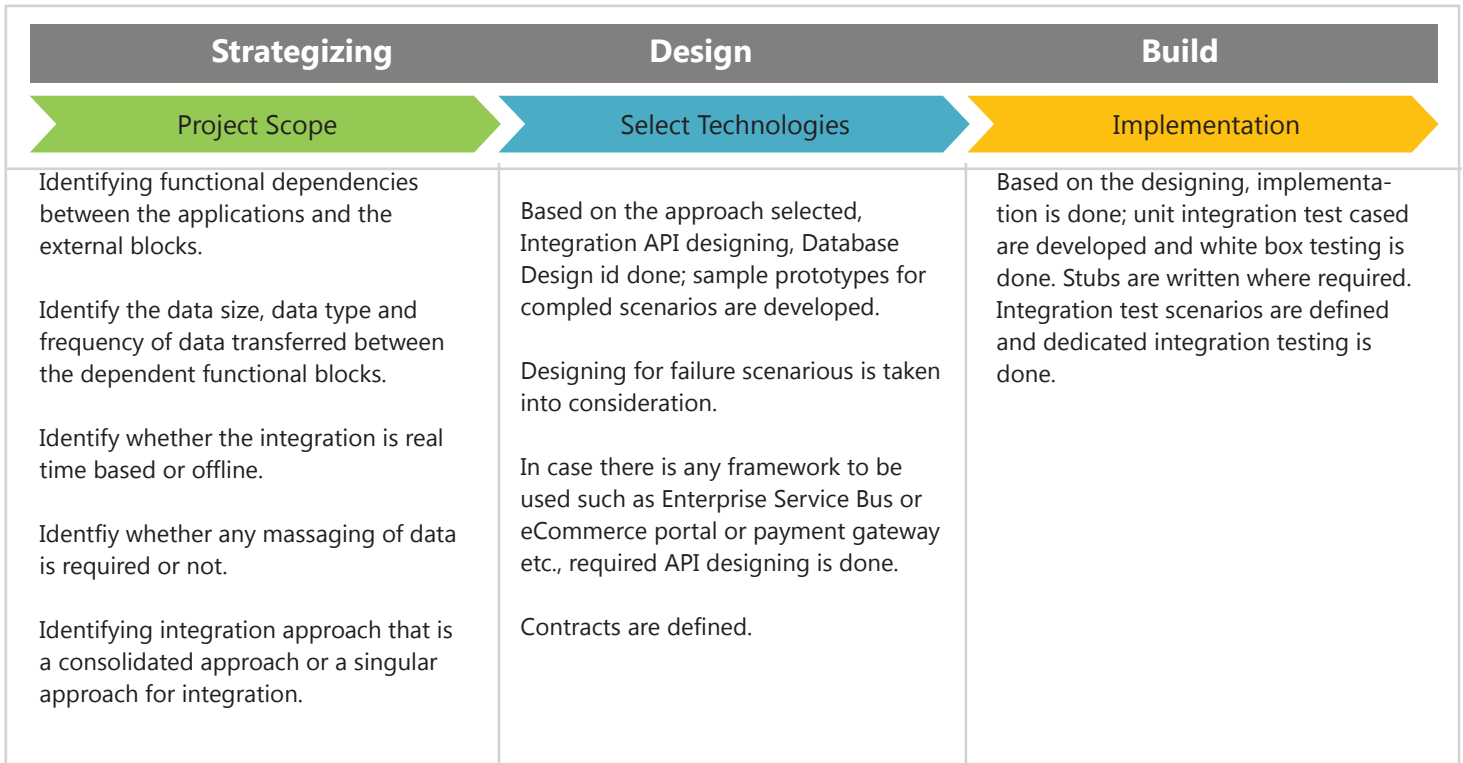| iPaaS				
Description	**Attributes**	**Benefits**	**Challenges**	**Best-fit**
iPaaS has only been available for the last five years, but has experienced rapid proliferation of solutions and adoption in the market (see "Integration Platform as a Service: Moving Integration to the Cloud"). It was originally targeted primarily to SaaS integration projects, but is increasingly applied to A2A and B2B projects (see "iPaaS Expands Beyond Cloud Service Integration Through Flexible Deployment Topologies"). Most solutions have been built using some form of integration middleware code base and intellectual property that has accelerated solution maturity. Many iPaaS providers are still investing to expand functional capabilities to match more mature, best-of-breed integration middleware solutions.	Integration interfaces are developed (by the user organization) using an iPaaS. The user organization (or SI) is in charge of interface development/testing, ongoing maintenance and operations of the integration interfaces. The cloud provider is in charge of iPaaS operations.	Modern, high-productivity integrated development environment, often including a wide range of adapters, integration interfaces and templates. No integration platform operations to burden user organization. Operational expenditure, subscription-based approach for infrastructure. Short time to development, with little to no product installation or configuration.	Suboptimal for demanding (e.g., high performance, low latency or high volume) scenarios mixing A2A, B2B and cloud integration requirements. Relatively unproven for large-scale A2A and traditional B2B (trading partner) integration projects. Requires perennial integration project development and ongoing maintenance. Limited availability of skills for relatively new iPaaS platforms.	Your project's center of gravity is cloud, but also involves some A2A and B2B integration. You prefer funding your project with operational expenditure for infrastructure, and using internal head count for development. You're comfortable outsourcing the integration infrastructure, but prefer to unilaterally manage your own project implementation. You have an aggressive time-to-deployment requirement (iPaaS does not require installation). There's a provider of iPaaS that meets your particular project, industry and regional requirements.

Integration Brokerage

Description	Attributes	Benefits	Challenges	Best-fit
Integration brokerage (IB) is an IT managed service that delivers people, methodologies and technologies for B2B eCommerce and cloud services integration projects. The technologies are enabled by cloud-based integration functionality ranging from traditional multitenant configurations to iPaaS. IB has a long heritage as electronic data interchange (EDI; or B2B) managed services, whereby providers implemented and managed B2B integration projects related to e-commerce projects involving processes such as procure-to-pay and eIinvoicing. More recently, IB has also been leveraged for cloud services integration projects, typically involving SaaS integration with on-premises applications and often in conjunction with traditional B2B projects. In nearly all cases, a company pays the provider a one-time fee for project implementation (e.g., for B2B adapters, cloud APIs, maps for translation and trading partner onboarding) and recurring fees for project management (e.g., support).	Integration projects are developed on an externally hosted integration platform (iPaaS or other). The provider of IB is in charge of the integration project implementation, ongoing project maintenance	Integration project implementation and management are outsourced. There is no need to subscribe to/license integration middleware/iPaaS. In most cases, it leverages a high-quality infrastructure with minimal investment. Providers have invested heavily in technology, data center "hardening," disaster recovery and so on. There is a single point of contact for all needs — the provider. It frees up internal resources for other IT projects.	Real or perceived risk of losing project control. Long-term project viability depends on IB provider viability and a good working relationship with the provider. Vendor landscape is volatile (e.g., Inovis acquired QRS, and then GXS acquired Inovis). Vendor lock-in and loss of direct control over integration project intellectual property (profiles, maps and so on) is characteristic of this approach.	Project's center of gravity is B2B integration, but also involves some A2A and cloud. The provider of iPaaS meets your particular project, industry and regional requirements. Preferred mode of funding your project is with operational expenditure, using external infrastructure and head count. Lack of the requisite integration skills and hence the preference to outsource. Aggressive time-to-deployment requirement (no installation required; provider scales fulfillment capacity). The provider of IB meets your particular project, industry & regional requirements. Outsourcing integration can free up internal IT / resources.

TekMindz's 3Phase Structured Approach for Application Integration

TekMindz's enterprise application integration practice helps enterprises in managing, deploying and integrating their applications by aligning their application portfolio with their long term business strategies. We help enterprises assess their application integration initiatives by defining application integration projects specific to their individual requirements through our tailored methodology:

TekMindz's **3Phase Structured Approach** for Application Integration

Strategizing	Design	Build
Project Scope	Select Technologies	Implementation
Identifying functional dependencies between the applications and the external blocks. Identify the data size, data type and frequency of data transferred between the dependent functional blocks. Identify whether the integration is real time based or offline. Identfiy whether any massaging of data is required or not. Identifying integration approach that is a consolidated approach or a singular approach for integration.	Based on the approach selected, Integration API designing, Database Design id done; sample prototypes for compled scenarios are developed. Designing for failure scenarious is taken into consideration. In case there is any framework to be used such as Enterprise Service Bus or eCommerce portal or payment gateway etc., required API designing is done. Contracts are defined.	Based on the designing, implementation is done; unit integration test cased are developed and white box testing is done. Stubs are written where required. Integration test scenarios are defined and dedicated integration testing is done.

About TekMindz

TekMindz is an IT consulting & technology services company with headquarters in India, serving clients across Asia/Pacific, Middle East, North America and Africa. Bringing together technology, people and processes across diverse sectors for organizations around the world, TekMindz enables business enterprises and governments to most effectively serve their customers and citizens.

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