The Application Integration Process

The Kickoff

It may start as a simple question from management, "Why don't we link these two applications so we can avoid manually having to transfer the same data between systems?" However, it is not such an easy question to answer and it can be many time more difficult to put a solution in place. And, do not even think about the complexity that would be involved if there were to be a change in the requirements once the process has gotten underway.

When considering an application integration project, it is important that the developers and project managers have a solid game plan before any physical development begins. These types of projects can become quite complicated because of the number of interactions that might occur between applications so solid and organized development program is an essential component of any such project. Addressing this challenge requires a strategic and systematic approach from management.

Begin with a Discovery Process

The project team should begin by conducting a thorough assessment of the existing systems and applications. Understand their architecture, data models, APIs, and technology stack. Identify areas where incompatibilities may arise. During the discovery process, information is collected, requirements are organized, some level of research and experimentation may be required, development resources need to be arranged, and the initial testing and deployment processes are created. Most importantly, a plan of attack needs to be created that lays out a roadmap allowing the team to steadily move forward toward success. This roadmap needs to identify and address key issues early in the program.

Define Clear Integration Objectives

Clearly define the objectives of the integration project. Identify the specific data and processes that need to be integrated. Having a clear vision helps in developing targeted solutions for incompatibility issues.

Identify Data Formats and Protocols

Identify and collect documentation on data formats and communication protocols. In a perfect world, these interfaces would all be standardized but the reality is that application functionality differs widely and evolves as new features are released so the assumption should be that these interfaces are not completely standard and that they

will evolve over time. Some applications do make use of interfaces based on published APIs (Application Programming Interfaces) and or generic data interchange formats such as JSON or XML. Interfacing an application integration network to systems that have a well-documented and understood foundation can significantly reduce the effort necessary to integrate the application into a larger information network, but some level of integration/customization should always be expected.

Implement Middleware Solutions

The architecture should always assume that an application integration middleware platform, such as i3, be deployed to act as intermediaries between applications. These middleware platforms are used to handle data transformation, protocol translation, and provide a common interface for applications with varying technologies. More advanced middleware systems such as i3, include features that provide governance and support between applications, are capable of supporting evolving and increasingly dynamic application ecosystems, and manages between internal and external application partners with equal ease.

Information Management

At an implementation layer, applications exchange information between APIs. When two applications have dissimilar APIs, a translation function is needed to equalize the information flow so the applications are able to communicate with each other. Unfortunately, most people who utilize application integration systems do not have the time or energy the master the APIs utilized by these applications. To simply operations for these users, it is important that the application integration system provide a naming or labeling system that allows the lay person to manage the necessary data flows while masking the complexity of the API from these users.

Data Transformation and Mapping

Tools and processes are needed for data transformation and mapping. These tools can convert data from one format to another, ensuring compatibility between systems with different data structures. Advanced versions of these tools can provide additional functionality that might include the ability to subdivide and combine messages coming from one application for delivery to another. The most advanced of these systems are even able to combine messages from multiple applications in order to create a new message expected by a remote application.

Employ Microservices Architecture

The team should adopt a microservices architecture where a single applications integration platform is used to manage a series of virtual service managers. Each virtual

service manager is targeted to support a specific class of remote intelligence and can be managed as an independent entity. With this kind of architecture in place, a common integration platform can support a wide range of application integration needs while isolating the interactions associated with each application. This allows each application interface to evolve independently from the larger system and provides an operational firewall to ensure issues associated with one application are unable to impact the operation of the larger information architecture.

Upgrade or Replace Legacy Systems

When deploying an application integration system, the administration should examine each application and consider its longevity and life cycle. If an application is nearing the end of its life cycle, the administration will want to ensure that the application integration system is able to support the cut over process that will be undertaken during the rollout of a replacement application. In today's data centric world, application cutovers may not be possible as a flash cut. This means that both applications might need to be on line simultaneously for a period of time while data and users are migrated to the new system as a series of tranches.

Collaborate with Vendors and Developers

Application integration programs are technical transformation processes and can take time to implement. Those undertaking an application integration process should actively engage with application vendors and application integration platform providers. It is important that all parties involved in the process understand their roadmaps for updates and improvements to the involved applications and the application integration platform.

Establish Data Governance

Data governance is a growing issue as organizations are being asked to increase their awareness of how data moves through and is used by an organization. The organization should implement a strong data governance practices into their application integration strategy that allows them to monitor the sources of all data going into and out of an application. Governance processes should also serve to document limitations and restrictions associated with data use so the organization can quickly and easily determine if their information network is in compliance with evolving data regulatory requirements. This includes documentation of data ownership, data sourcing, data quality, and maintaining a consistent approach to data management that provides organization-wide visibility to compliance with established data policies .

Continuous Monitoring and Testing

Implement continuous monitoring and testing processes to identify and address compatibility issues and performance issues as early as possible. Automated testing tools can help ensure that changes or updates to applications do not introduce new incompatibilities.

Provide Ongoing Training

Ensure that the IT team and end-users receive ongoing training on the application integration systems. This helps in avoiding errors caused by misunderstandings or lack of awareness about the integrated environment.

By adopting these strategies, management can successfully deploy an application integration program. The process is intended to systematically address and overcome application incompatibility challenges, creating a more integrated and efficient technology landscape. I3 Systems is an expert in data and information integration systems. The company has taken a unique perspective that seeks to manage the organizational data that flows between applications as an organization asset that can be actively managed to improve corporate performance. This perspective is a marked departure from the idea that data is a consumable that is fed to applications. The legacy view which served the industry well in its early years has the unintended consequence of creating operational silos within the organization whereas the i3 approach results in an architecture that increases the data efficiency and effectiveness of applications distributed across the organization's ecosystem. I

Driving the Project Forward

Application integration projects can be some of the most challenging projects an IT team can take on. Much of the complexity associated with these projects are related to the fact that the applications are software and therefore evolve during the application integration lifecycle. A successful application integration project has to anticipate that the applications will change and build an interface mechanism that can evolve as the applications evolve. Far too often, application integration projects are untaken, with the expectation that the interfaces will remain stable but unrealistic to expect targeted applications can be frozen in time. Luckily, the design of the i3 System was created to encapsulate application specific logic in targeted wrappers which minimizes the impact of such changes to the larger enterprise.

A common point of failure for many application integration projects stems from changing requirements. As the project begins to move forward and initial indications of success begin to emerge, additional parties begin to identify themselves that want to contribute to an emerging success. If the project was undertaken with the expectation that the system would only need to link two applications in a point-to-point, these late entrants which could amplify the benefit of the solution, often begin to drag the project down under its own weight. The dynamic data connection fabric built into i3, was designed to make it easy to add new participants to the

project over time and even to support a graceful application cutover process as older applications are being replaced with newer, more capable systems.

Unlike most other application integration packages that assumes linked applications are fixed, long term requirements, the i3 System assumes the connective fiber that links applications together is temporal. That is the application connective fabric has to easily evolve so that applications can be added and removed from the network and the data flows between these applications can be easily altered as needs change. Further, the i3 System assumes that while some interconnected application are managed by the same department, in many cases the applications will need to connect across organizational divides with independent departments being responsible for their portion of the application network.

Application integration projects can be difficult to master and there are plenty of examples where these projects have failed to deliver. Luckily, the latest generation of application integration tools have features and capabilities that are evolving the technology beyond legacy point-to-point solutions to allow the creation a network of interconnected applications. When these latest application integration tools are coupled with a robust deployment plan, the hurdles begin to come down enabling the emergence of the next generation of application networks.