The hidden costs of hand coding your integration

Discover the development, maintenance, and support pitfalls of a custom integration strategy

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Executive summary

The true cost of hand coding is not initially understood, yet despite this lack of clarity many companies still handle integration projects by writing custom code—typically to meet development efforts required by an immediate business need. The upfront benefits seem compelling: short start time, no new development tools, and simple deployment. However, as integration requirements inevitably grow, problems with custom code begin to mount. There is an inability to reuse custom code in many cases, it can be difficult to maintain, and often the original developer is no longer available. Custom solutions are neither scalable nor extensible. And as a result, what started as a simple project often becomes far more complex and costly than initially expected.

Today, more businesses are reconsidering rigid hand-coding practices that fail to support fluid digital business requirements. They are choosing to adopt a hybrid integration solution to achieve instant, low-cost integration through the use of pre-built workflow templates and other automated maintenance and management capabilities that reduce integration service from days or weeks to hours, with zero coding.

Hybrid integration solutions offer universal connectivity, flexible deployment options, and visual tools that empower technical and business users alike to make simple mapping adjustments, freeing up IT to focus on more strategic initiatives.

As we will discuss in this paper, these reasons and others support the move to a hybrid integration solution that lets you handle most integration operations transparently and in real time. Taking a solution-based approach enables you to address your data integration requirements without the cost, excessive maintenance, and business risk that comes with custom coding.

Anecdotal evidence from Gartner clients' experience suggest that by using an integration platform, time to value for integration logic can be reduced by up to 75% versus custom coding.

Introduction

Growth and profits are top business objectives today, and data integration is a critical enabler of the technologies that drive these goals. The approach you take to move, visualize, and combine data is almost as important as the data itself. Effective integration supports smooth business operations because it enables you to preserve data integrity and maintain employee trust in data and applications. For this reason, businesses must elevate the way they think about data integration from a "one off" process that is superficially executed, to a mission-critical business strategy that considers operational, economic, and strategic risks.

Data integration has evolved from an environment where traditional endpoints remained relatively static, to one of modern endpoints that are dynamic and constantly changing. In addition, businesses operate in a technology landscape that undergoes continuous transformation with the regular emergence of new applications and business models. These factors demand that companies can adapt new integrations quickly, make changes and fixes to breaks immediately if not automatically, and do it all in a secure and stable way. In addition, there is a critical need to empower more users to be more hands-on with their technology to avoid IT bottlenecks.

In the hybrid, hyper-connected world, operating at the speed of business is a priority. Leading businesses must be able to deliver integration development, maintenance, and support services efficiently and cost-effectively, on premises and in the cloud, with a high degree of competency. IT and business leaders looking to assess their qualifications are wise to ask:

- How fast and how easily can your business integrate data from new applications?
- Can business users make simple changes or are they fully dependent on IT?
- How quickly can you resolve integration breaks?
- Does your integration process scale to match growth?
- How do you link data on premises and in the cloud?
- Does your integration approach keep data reliable and available, with improved integrity system wide?

Reasons to rethink hand coding

For many organizations, it can be tempting to use hand coding for data integration. Maybe this is the choice because of longstanding IT practices, or the product's API seems easy to interact with, or the project starts as a simple point-to-point integration. The hidden costs of hand coding, however, can add up quickly and take a measurable toll on the success of the project.

Lack of reusability leads to added cost

One of the top drawbacks of hand coding is cost: since custom code can't be easily re-used, you must continuously invest to re-write the same type of integration over and over. In addition to the economic impact, the business is left waiting for the project to launch and may suffer because data is unavailable.

Brittle code creates a maintenance overload

Another hidden cost of hand coding is the inevitable maintenance workload that requires someone to fix frequent integration breaks—a common occurrence with custom coding. Providing support for custom coded integrations such as incorporating new changes by hand keeps mean time to repair low because custom work is typically not scalable or extensible. With static, custom code that is created for an initial business objective, there is no flexibility when workflows or business needs change. The only option is going back into the code, which is time consuming and complicated, and may cause other areas of the integration to break.

Developer turnover cuts knowledge ties

A key factor in taking a custom approach is the inherent tie between a specific developer(s) and the integration, versus between a technology solution and the integration. With a custom approach, someone on the team creates the code and ideally, they handle fixing breaks. But when they leave, or get reallocated to a different project, the business must rely on documentation, if it exists. Turnover of this kind can leave a confusing path to follow, which can result in the loss of original planning and strategy that was first built into the integration.

Custom work holds inherent weaknesses

Increased cost and excessive maintenance are two negatives of custom coding, but it could be said that there is inherent weakness in taking a custom approach to solving any business problem—especially one as important as data integration. Because custom coding by its very nature lacks standardization, it takes on its own unique characteristics. This means developers must go to the drawing board, engage in the planning process, and handle the new requirement for every custom job. The lack of standardization causes duplication of work and planning, which leaves decision-makers waiting for their data. A slow pipeline of business intelligence can stifle new initiatives, and take a business off course.

A homegrown IT approach may bring an initial 20 percent cost reduction, but result in a 200 percent increase in maintenance costs.[1] —Gartner

Unpacking the hand-coded project

As businesses mature, they reevaluate longstanding processes like hand coding, which may no longer be effective for executing data integration projects at the speed of business. It can become a case of using an old approach to solve the latest challenges, without fully grasping the negative business impact. For this reason, it's important to analyze the full impact of custom coding to understand the true business cost.

Rating your custom code approach

When evaluating your current data integration processes, ask if your hand-coding approach offers an efficient way for your business to:

- Cost-effectively implement integration projects

- Monitor and quickly address integration breaks

- Connect to emerging cloud applications

- Rapidly onboard customers by reusing templates

- Scale to meet current and future integration needs

Although hand coding may seem like a quick-start option, just using in-house staff, there are other factors to consider. For instance, does customer satisfaction suffer if it takes longer to get an application on line? Do business partners experience any inconveniences or loss of value because uptimes are affected, or data may not be available on schedule?

In a quickly changing and highly competitive world, continuing an old practice hoping to make it better is simply inefficient.

Could your business have integration tunnel vision?

An unfortunate, yet common, habit in business is to adopt applications without considering how they will interoperate within current enterprise systems, or mesh with future innovations. For instance, a ServiceNow integration must connect to an existing on-premises ERP application. The business assigns the task to IT, and the team begins a custom point-to-point integration, batch integration, or FTP file transfer approach. Chances are, this process does not include building in monitoring and audit tools to manage error handling and logging functions, which means as errors arise they must be handled in a reactive versus proactive manner.

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[1] https://www.gartner.com/doc/3432617/does-customcoded-data-integration-stack

Without adequate up-front planning to understand how an integration fits into the rest of your enterprise systems and workflows, the custom code can become easily broken when an ancillary process changes but is not "seen" by the custom code. The result is that the code not only requires careful maintenance to remain agile, but fails to support real-time business. What began as a seemingly simple custom project ends up requiring skilled development resources to maintain and scale over the long term.

The resource drain of custom coding

Take a moment to consider the array of rapidly-changing APIs. Not only are there APIs for cloud applications, which can change four or more times per year, but the APIs of every application that your SaaS solution links to. If you've added custom fields or objects to your SaaS application, this can further complicate the recoding task. Any break in the code is a break in the integration—and a potential break in critical business processes.[2]

Hand Coding vs a Hybrid Integration Solution

Category	Hand Coding	Hybrid Integration Solution
Maintenance Costs	**Very high.** Constantly requires skilled development resources.	**Very low.** Easily maintain integration with a few clicks.
Reusability	**Little to none.** Each integration must be built from scratch. Little standardization between integration projects.	**Yes.** Designed with reusability as one of its core tenets, with workflow templates to accelerate the integration projects.
Monitoring and Error Detection	**Manually** - Build monitoring and audit tools to manage error handling and logging functions.	**Automatically** monitor, detect and notify of errors using built-in tools.
API Restrictions	**Introduces significant complexity** which can hamper the integration performance process, and scalability.	**Processes data faster** and delivers an optimized solution without the pain of iterative development.
Changes to Business Processes & APIs	**Very expensive and time consuming** – to handle, requiring skilled programmers.	**Dynamic configuration** changes to cope with business process changes and APIs.
ROI	**Negative.** Small upfront costs heavily offset by constant maintenance needs, lack of reusability, and frequent integration breaks that compromise application value.	**High ROI.** Significant time and resources are saved during implementation, execution and maintenance of an integration project.

[2] https://betanews.com/2017/01/03/hand-coding-drawbacks/

When you choose to hand code, it can go like this

Consider some of the activities and events that add up in a hand-coded integration scenario, then consider the amount of time it takes, the amount of skilled staff that must be dedicated to the task, the cost, and the potential issues that can arise.

- You must link to applications that each have hundreds of fields of data, many in different formats
- Keeping applications talking to each other requires lots of ad-hoc hand coding between different data sets, requiring expert IT resources and on-going maintenance
- Documentation of the integration must be created to ensure that the details of the integration are preserved for future changes
- If the programmer who handled the integration leaves the company, someone else might have to spend considerable time trying to understand exactly what the application was doing to make any changes
- A single small tweak, such as changing the data type of a field in one of the source tables, could easily break the entire system

Operational, strategic, and economic risks of hand coding

For many organizations, the lure of tasking IT with every integration is still a common consideration, though the additional operational, strategic, and economic risks that come with this approach are often overlooked.

In *operational risk*, the constant rate of change in data systems and technologies creates a steady development workload that can drown IT resources in change cycles. With IT teams focused on heavy custom maintenance load, they can't work on higher value IT initiatives.

When it comes to *strategic and economic risk*, if your core IT team is gridlocked in code changes and endless mapping exercises, your ability to innovate is hindered. That means if the business wants to undertake strategic projects, it must hire new full-time staff or contract developers, which impacts the bottom line. And more importantly, the project that could take your business to the next level is deprioritized while custom projects are being reconfigured.

Avoid the risk of custom coding: take a solution-based approach

More and more organizations are replacing their custom code approach with a hybrid integration software that offers universal connectivity, flexible deployment options, and visual tools that give technical and business users more control to make simple mapping adjustments, allowing IT to focus on more strategic initiatives.

These solutions can shorten the learning curve for both IT and business users, which can increase adoption and speed availability of new applications. Unlike the maintenance hurdles that come with changes to business processes and APIs, integration software alters the configuration on the fly to accommodate any changes to business processes and APIs.

A graphical, intuitive user interface enables non-technical users such as business analysts to create and repair simple integrations, which means users can feel more confident in their ability to control their data and applications.

Businesses can reduce development time and resource requirements with these capabilities:

- Rapid design, deployment, and management of integrations on-premise, in the cloud, or in hybrid environments without the complexity or hassle that come with an enterprise software stack
- Reusable templates, engineered to quickly integrate diverse data and applications from a broad spectrum of endpoints
- Hundreds of connectors to common applications such as ServiceNow, Salesforce, NetSuite, Oracle, SAP and Workday
- A graphical toolset with API and connectors that visually guides users to build integrations with emerging cloud APIs and custom connections when needed
- Automate enough processes to eliminate the need to bring on additional staff

The "hybrid integration platform" is emerging as the capability framework of choice for the design of modern integration infrastructure.[3]

[3] https://www.gartner.com/doc/3593117/innovation-insight-hybrid-integration-platforms

Flexible integration for a mix of use cases

Hybrid integration solutions offer businesses a wide range of capabilities for performing data integration for all types of business use cases, including the flexibility to adapt easily to various end points, and work across a mixture of integration patterns such as data and application integration. They come as fully managed solutions, or self-service, depending on business requirements. With an instant-on solution, IT teams are free to keep strategic projects moving forward because the hybrid integration solution can take over much of the maintenance workload.

Development teams can trade in a growing backlog of IT projects and broken integrations, and integrate applications faster, better, and less expensively. More applications can be integrated and built in a more dynamic fashion, than if every integration were custom-coded—even with a sharp development team. This boost to IT performance can have a direct and positive impact on the bottom line through greater application uptime and usability, and by ensuring users have the latest information for decision making and analytics.

Using a hybrid integration solution also gives you the ability to offload the constant strategic decisions that arise with custom code, to provide a quick return on investment. In an era of tightening budgets, and the pressure to do more with less, a hybrid integration solution can help rein in costs and make staff more productive.

Whether you must connect and integrate customer data from key business areas, move and transform data when replacing legacy applications, or connect hundreds of applications, a hybrid integration solution can help. These solutions enable business to quickly implement and easily manage the integration process and achieve fast time to value.
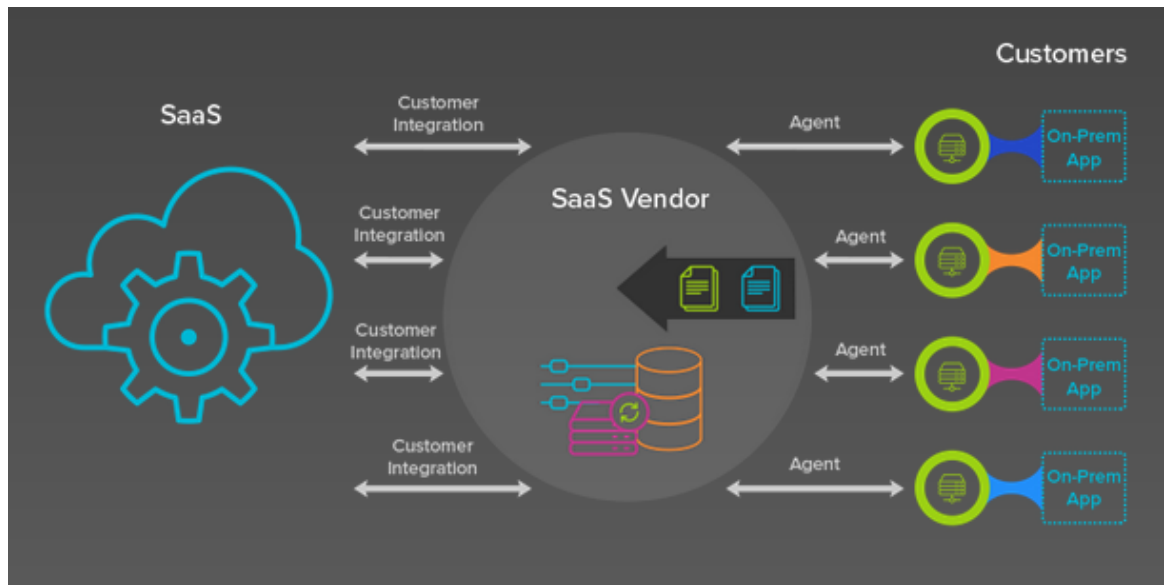
Hybrid application integration helps service delivery teams (e.g. SaaS ProServ team, Systems Integrator) rapidly onboard and maintain application integrations across their customer base.

An easy way to deliver data integration for SMBs

Because many small and medium-sized businesses (SMBs) lack a dedicated Integration Competency Center, having a hybrid integration solution can make it easier to deliver simpler, faster configuration and flexible deployment options. Businesses gain the ability to easily work with diverse combinations of resources, applications, data, processes as well as sources inside and outside the organization. User adoption is greater via lightweight desktop integrated development environments that let users visually create or modify integration maps, schemas, artifacts, rules, and job schedules in minutes, without coding or scripting.

Summary

The need to integrate strategic applications is critical to preventing business gridlock that can reduce profits and ultimately growth. Businesses need a process in place that fosters innovation, speeds deployment, and keeps costs low.

It is easy to understand the appeal of hand coding due to its apparent simplicity. However, the true cost of taking a hand-coding approach to data integration can be significant when you consider reusability, maintenance, scalability, and user adoption, among others. The strategic, economic, and operational cost of maintaining code, particularly with the impact of a change at scale, can quickly become overwhelming. Businesses simply can't compete using hand-coding techniques, especially if competitors are integrating data with modern tools at a faster pace.

The efficiency gains provided by a hybrid data integration solution can eliminate time spent troubleshooting, reworking brittle code, and directing significant resources to making updates and changes. Businesses that trade custom coding for a hybrid integration solution can realize gains in reduced time-to-market, cost efficiency, and greater revenue. More importantly, choosing a hybrid integration solution advances the way your business views its data integration strategy from an unstructured and spontaneous operation to one that recognizes the high value and criticality of integrating important applications and data in your enterprise.

The Actian hybrid data integration solution portfolio

Actian offers a range of hybrid integration solutions that deliver frictionless data integration. You can trade time-consuming, custom work and time spent tracking and documenting integrations, so your business can embrace its entire data ecosystem.

Actian DataConnect	Supports a wide range of enterprise-grade integration processes with a library of hundreds of connectors, and enables rapid onboarding and self-service integration.
Actian DataCloud	Links SaaS applications, or on premise to cloud, through an elastic, cloud-based platform that makes it all fast and easy.
Actian Business Xchange	Fully-managed B2B integration service that automates workflows with buyers and suppliers to improve financial results for procure to pay and leads to cash.
Actian PointConnect	Delivers instant, point-to-point integration by providing pre-built template workflows specific to the applications. Alters the configuration on the fly to accommodate any changes to business processes and APIs to ensure you maintain your integration with proactive monitoring, error handling, and scalability.

Actian Hybrid Data Integration solution capabilities

- **Instant, drop-in integration** – Pre-built workflow templates reduce your integration implementation from days or weeks to hours, with minimal coding
- **Environment flexibility** – Choose an architecture-agnostic solution that lets you design, deploy, and manage in any environment (on-premise, cloud, hybrid)
- **Simple mapping** – Empower endpoint users to make simple mapping adjustments and reduce IT bottleneck
- **Error remediation** – Quickly adapt to changes with proactive alerting and simple remediation tools
- **Trading partner management** – Set up, manage and monitor hundreds of connections – it's even more important that you don't hand code here

- **Cloud deployment** – 100% cloud, with on-premises connection/execution options

Universal Connectivity

Along with hundreds of connectors to common applications and systems, Actian includes an API Invoker that allows you to quickly integrate with emerging applications such as:

- **Infrastructure** – Amazon AWS, Microsoft HW/SW
- **Corporate applications**
- **Devices** – Alexa, HVAC
- **Web content** – .com, .org
- **Ecommerce** – Alexa, HVAC
- **Lightweight apps** – Evernote, Calendar, Clock, Translator

Learn more

To learn more about how Actian Hybrid Integration solutions can jump start your data integration project, email DataConnect.Enterprise.Sales@actian.com to request a no-cost evaluation license.