



Unleash the power of APIs: A guide to API-led connectivity

Improve API reuse and organizational agility

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Executive summary

Siloed applications and cumbersome point-to-point integrations hinder businesses from delivering real-time, personalized experiences. Manual processes slow businesses down, stifle innovation, increase costs and limit adaptability.

API-led connectivity offers a modern solution to this problem. Application programming interfaces (APIs) act as messengers between applications, enabling efficient data sharing, cross-system functionality and IT process automation. By creating well-designed, reusable APIs, organizations can eliminate redundant development efforts across projects. This translates to faster integration times, quicker delivery of new features and ultimately, a significant acceleration of time to market.

However, the proliferation of APIs introduces challenges related to managing complexity, API bloat and inconsistencies in the API approach. Effective API management is key to ensuring consistency, governance and control over the ever-expanding API landscape. Additionally, application integration platforms help address these challenges by providing robust tools for API reuse and empowering business users.

This white paper reflects the perspective and extensive experience of the two authors—Michael Thompson, Integration Program Director at IBM, and our Thor Ingham, CTO of IBM Business Partner Avella AS. Their combined experience in the field of integration spans over 25 years. It originated as a session at IBM TechCon 2024 jointly presented by Mike and Thor, “Putting APIs to work: API-led integration strategies and considerations.”

Businesses can gain a significant competitive edge by adopting an API-led connectivity strategy. Reusable APIs act as building blocks, simplifying integrations and accelerating development cycles. APIs also open doors to innovation and collaboration, enabling creation of new revenue streams. However, challenges exist. Managing a growing number of APIs requires control and a clear understanding of their purpose. The solution lies in selecting the right tools and developing a well-defined API strategy to maximize the benefits of API-led connectivity.

While APIs drive innovation and agility, effective management and governance are key to ensuring consistency and mitigating risks and security vulnerabilities. API governance and management offer a solution. Governance sets standards and best practices, while API management tools centralize control and analysis. This unified approach promotes secure, efficient API use. By implementing a robust API management strategy, organizations unlock the full potential of APIs that can lead to a competitive edge in today's digital landscape.

The API-led approach prioritizes reusable APIs, delivering benefits for both technical and business users. Reusable APIs can reduce development time and complexity, enhance speed and accuracy, ensure consistent user experiences, and enable faster adaptation to changing business needs. Advanced AI-powered solutions such as IBM API Connect®, IBM® App Connect and the newly acquired webMethods offerings further streamline integration processes. Even “citizen integrators” with limited technical expertise can leverage reusable APIs, fostering collaboration and accelerating business value. By embracing API reuse, organizations unlock a unified, agile API ecosystem that can optimize costs.

As organizations become more sophisticated with their use of APIs, they move through distinct maturity stages, each with unique challenges and opportunities. Most businesses start with a lack of structure and aim to reach a standardized, API-centric approach. Reaching the most mature stage, which uses a hybrid platform enabling self-service API creation, indicates that you're fully capitalizing on APIs. A shift toward a more automated approach can lead to a 10–100x increase in integrations delivered within a given timeframe.¹ These benefits justify the effort to travel through the maturity curve.

By embracing a strategic approach to API integration, deploying effective API management and governance, promoting API reusability and integration, climbing the API-led connectivity maturity curve and empowering citizen integrators, organizations can harness the power of APIs to drive business success in the ever-evolving digital landscape. Both IBM and our partners, such as Avella AS, are committed to helping businesses navigate this exciting journey.



02

Navigating the API landscape in an evolving marketplace

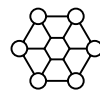
API adoption is surging, driving rapid market expansion. Businesses are increasingly using APIs to integrate applications both internally between departments and externally with partners and customers. This use streamlines data exchange and fosters collaboration across the entire ecosystem. A recent study sponsored by Noname, a leader in API security, revealed that the average organization now manages over 15,564 APIs.² Furthermore, APIs are not confined to a specific industry. From finance and healthcare to automotive and retail, organizations across all sectors are turning to APIs to take advantage of digital interaction. This surge is driven by several key trends:



Customer demand: Today's customers expect seamless, personalized experiences across all touchpoints. APIs enable near real-time data sharing between applications, fostering a more connected user journey.



Digital transformation: The COVID-19 pandemic accelerated the shift toward digital business models. APIs provide a flexible and agile way to integrate disparate systems, helping deliver faster innovation and improved time to market.



API democratization: Modern APIs built with technologies such as REST and JSON are easier to use for a wider range of developers. This fosters a culture of API-driven development and reusability.

APIs can provide faster innovation, increased agility and improved time to market across all businesses sectors.

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Benefits of an API-led connectivity strategy

The trends just described underscore the critical role of API-led connectivity in today's business landscape. By adopting a strategic approach to API integration, organizations can use APIs to enable agility, innovation and improved customer experiences.

API-led connectivity is the key to digital transformation. By establishing a foundation of reusable APIs, organizations can streamline integration efforts, improve data flow and empower faster development cycles. These advances can translate into a significant competitive advantage in today's dynamic market.

APIs act as shared assets to help simplify integrations by providing precreated building blocks for data access and functionality. These integrations can reduce development time and costs while helping improve the accuracy and consistency of data flow.

The benefits of API-led connectivity extend beyond cost savings and efficiency. Enabling faster and more adaptable integrations helps businesses:

- **Respond more quickly to market shifts:** With readily available APIs, organizations can adapt their offerings and services to meet evolving customer needs and industry trends.
- **Deliver improved customer experiences:** APIs facilitate seamless integration of data and functionality across applications, leading to a more personalized and seamless customer journey.
- **Embrace new opportunities:** APIs provide a foundation for building innovative solutions and partnerships. Organizations can leverage external data and services to create new revenue streams and enhance their value proposition.

However, as API-led connectivity gains momentum, organizations encounter specific challenges. For instance, a growing number of APIs can introduce complexity issues. Effective API integration is vital to ensuring consistency, governance and control over the ever-expanding API landscape.



It's clear APIs are not a panacea. A solid technical understanding is critical to know which types should be used for which purpose. If APIs are created with no clear purposes—that is, with no clear business case—this can lead to API bloat. Inconsistencies in an organization's API approach will likely mean that the organization can't live up to the hype.

Additionally, we're finding that many organizations are proactively seeking out APIs while evaluating software purchases. For example, they need to check that new CRMs or data warehouse solutions have working APIs. Procurement teams are integrating API functionality and live demonstrations into the software selection process. This helps confirm that chosen solutions not only meet core needs but also include well-functioning APIs. This is a best practice that, in the long term, reduces integration costs.

One response to these challenges is selecting the right tools. For instance, the IBM comprehensive suite of integration solutions, including IBM API Connect, IBM App Connect, and the webMethods iPaaS, offers a central hub for managing the entire API lifecycle. This feature helps provide consistency, governance and control over API creation, testing, deployment and consumption.

Another key aspect is developing an effective API-led integration strategy, which involves a structured approach, standardization and using a shared distributed platform.

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API management and governance: Challenges and solutions

The increasing adoption of APIs within organizations creates a need for consistency and strong governance. Businesses must efficiently monitor and adjust their APIs at scale while ensuring functionality and focusing on security.

Imagine an organization with numerous APIs scattered across departments, each developed and managed independently. This “API sprawl” can create inconsistencies and security vulnerabilities. Monitoring and adjusting these APIs becomes a cumbersome task, hindering agility and innovation. Additionally, preventing API redundancy—where teams reinvent the wheel instead of reusing existing integrations—becomes key for optimal resource allocation. Building and reusing APIs as building blocks helps organizations accelerate the integration of business apps and systems across the enterprise.

Taking the helm

API governance establishes consistent standards and best practices for API development, deployment and use. It helps ensure alignment with business goals and mitigate risks associated with API sprawl.

API management is the practical implementation of these governance principles. It provides a centralized platform for creating, publishing, controlling, troubleshooting and analyzing APIs. Together, API governance and management create a unified approach to taming the API landscape.

API governance, security and management

API governance sets the strategic direction for API management. For instance, a governance policy might mandate centralized API development tools or require specific security protocols. Effective API management implements these policies, integrating seamlessly with security protocols like OAuth and encryption to help safeguard APIs and data.

API governance is not a roadblock. Instead, it provides the framework for a highly secure and efficient API management strategy.

Building the command center: Components of an API management platform

An API management platform acts as a central hub for managing all APIs within an organization's ecosystem. It offers a suite of tools that can streamline deployment, documentation and sharing across development teams. Here are the key components:

- **API gateway:** The front line, handling routing requests and conversions between clients and services. It focuses on security protocols like TLS encryption and OAuth.
- **API developer portal:** A self-service hub for developers to access and share API documentation, simplifying communication and collaboration
- **API analytics:** Used to track usage metrics like response time, availability and overall performance. It helps you diagnose issues and make informed decisions about APIs.
- **API lifecycle management:** Manages the entire API lifecycle, from creation to retirement, helping ensure version control and efficient onboarding

Benefits of API management and governance

For organizations juggling multiple APIs, API management offers several significant advantages:

- **Reduced costs and development time:** By reusing API integrations through a central platform, enterprises can save time and resources. Developers can easily share documentation and code constructs to accelerate development.
- **Enhanced security:** Tracking API usage and integrating state-of-the-art security protocols like OAuth can safeguard existing services.
- **Improved agility:** API management platforms promote rapid creation, sharing, monitoring and adjustment of APIs, fostering long-term competitiveness.
- **Increased lifecycle oversight:** Organizations can gain comprehensive control over API versions, from staging to deprecation, to improve adherence to governance needs.
- **Expanded reach:** By publishing and promoting APIs across environments, businesses can reach developers while aligning with DevOps practices.
- **Community management:** Enterprises can grow their go-to-market channels effectively by leveraging subscription and community management features.
- **Data-driven growth:** Extensive analytics accelerate informed decision-making, while accessible data fosters innovation and growth.
- **Monetization:** By exploring a variety of approaches to monetize APIs, organizations can discover the right value stream for their business model.

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The power of reuse: Building a unified API ecosystem

The rise of the API-led approach represents a shift in how organizations think about integration. Traditionally, integrations were viewed as point-to-point connections between specific systems. However, with an API-led approach, the focus is on creating reusable APIs that can be shared and consumed by various audiences. This creates significant benefits for both technical and business users.

The efficiency engine

By creating reusable APIs, organizations can significantly reduce development time and costs. A single, well-designed API can be used across multiple applications and integrations, eliminating the need for repetitive coding efforts. This approach fosters composability, allowing developers to assemble applications by combining existing APIs—like building blocks—to meet new challenges.

Creating value through reuse

Here's how reusing APIs unlocks value for organizations:

- **Reduced complexity and cost:** Reusable APIs form a foundational library, minimizing the need for repetitive development efforts. This translates to lower development costs and a less complex integration landscape.
- **Enhanced speed and accuracy:** By leveraging existing APIs, you can build integrations faster and with fewer errors. Reusing established assets reduces development time and minimizes the risk of errors introduced by writing new code.
- **Consistent customer experiences:** APIs power both internal systems and customer-facing applications. Reusable APIs ensure these experiences remain consistent, regardless of the application or channel.
- **Agility in the face of change:** When business needs evolve, reusable APIs allow for adjustments at scale. Changes can be made to the core API, which will automatically impact all dependent integrations, minimizing the need for one-off changes.
- **Amplification with AI:** Advanced solutions such as IBM API Connect and App Connect leverage AI to further streamline integration processes. This includes functionalities such as data mapping assistance and robust API testing capabilities.



API reuse extends beyond technical teams. IBM App Connect, IBM API Connect and IBM webMethods provide user-friendly interfaces that empower “citizen integrators”—business users with limited technical expertise. These tools enable organizations to focus on their business objectives by allowing users to discover and reuse APIs without needing deep technical knowledge. This fosters collaboration between technical and business teams, accelerating integration initiatives and driving business value.

By embracing API reuse, organizations can build a unified API ecosystem that fosters agility, innovation and cost optimization. This approach empowers both technical and business users, accelerating integration efforts and unlocking the full capabilities of the API-led approach.

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Moving up? The API-led connectivity maturity curve.

Unlocking the true potential of APIs requires a strategic approach to integration. Organizations can progress through distinct stages of maturity, each with its own challenges and opportunities. Navigating through these stages enables organizations to achieve significant productivity gains—up to a 100-fold increase in the number of integrations delivered within a given time frame.¹

... organizations [can] achieve significant productivity gains—up to a 100-fold increase in the number of integrations delivered within a given time frame.

Our IBM Business Partners with years of working with clients have identified the following stages of API maturity:

1. **Unstructured approach:** This initial stage is characterized by a lack of centralized planning. Point-to-point integrations dominate, leading to a spaghetti architecture of disparate tools and technologies. IT sprawl and shadow IT become significant concerns, hindering application maintenance and innovation.
2. **Standardization:** Organizations move toward a more standardized approach by adopting a common integration platform and established methodologies. Defined roles and responsibilities improve governance, while a central integration team streamlines development and management. This stage can foster consistency and reduce integration complexity.
3. **Shared distributed platform:** The most mature stage uses a hybrid integration platform, enabling industrialized integration development that's accessible across the entire organization. Internal ownership of the platform empowers business units to create and expose APIs independently. This approach promotes agility, scalability and a culture of API-supported innovation.

It's important to identify an organization's current stage and establish a path toward a standardized and API-centric approach. Our Business Partners note that most businesses begin at Stage 1, lacking a structured approach. While some may find comfort in Stage 2, reaching Stage 3 unlocks the full potential of APIs.

Empowering integrators in an evolving landscape

As organizations move up the maturity curve, user empowerment across personas increases.

- **Integration specialists:** The original integrators, this group focuses on enterprise-wide projects, governance, and comprehensive tooling for foundational integrations.
- **Line-of-business (LOB) teams:** These teams of technical users embedded in the organization make use of self-service tools for faster integration cycles and API creation, fostering an API-first approach.
- **Citizen integrators:** This emerging trend empowers business users without deep technical expertise to build custom automations using readily available APIs.
- **Digital integrators:** For digital integrators, AI and machine learning will play a significant role in future integrations, helping enable automation and a more intuitive approach.

The importance of foundational work

Our Business Partners emphasize the importance of establishing a solid foundation in the first stage. This includes exposing valuable enterprise data through APIs. Without this groundwork, the potential of later stages, such as citizen integrators and AI-driven integrations, cannot be fully realized.

But why adopt a more automated approach to integration? Our Business Partners' experience suggests that significant productivity gains are achievable. Organizations embarking on this journey can expect an increase in the number of integrations delivered. Unless modern APIs are used, connections to established applications can be challenging due to limited resources. By equipping engineers to build reusable APIs that expose existing data, organizations can extend low-code integration tools to all sources, not just cloud-based ones.

The ability to automate for nonspecialists using governed low-code tools is where our Business Partners see a huge productivity leap. Freed-up integration specialists can thus become proactive enablers for multiple projects. These substantial benefits justify the investment in building a strong foundation and progressing from Stage 1 to Stage 3 of the API-led connectivity maturity curve.

IBM offers a comprehensive integration set of solutions to support organizations at every stage of the API-led connectivity journey. From establishing a foundational integration platform to fostering API creation and management, IBM helps businesses reach the full potential of API integration.

A real-world example: TINE's journey to API-led connectivity

TINE, Norway's largest dairy producer, faced challenges due to a complex, siloed value chain. Data sharing between factories, warehouses and distributors lacked consistency. IBM Cloud Pak® for Integration and the IBM manufacturing solution helped TINE establish a coherent, fully integrated enterprise. Over 300 integrations were built, connecting 7,000 dairy farms and integrating over 32 existing systems. The story serves as a compelling illustration of the benefits of a well-planned API strategy. Read the TINE case study [here](#).

Understanding the API-led connectivity maturity curve equips organizations to assess their current state and chart a course for improvement. By leveraging IBM solutions and the principles outlined in this white paper, businesses can take advantage of APIs to drive innovation, agility and a forward-looking digital strategy.

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Conclusion

By adopting a strategic approach to API integration and climbing the API maturity curve, organizations can tap into the potential of API-led connectivity, promoting agility, innovation and cost optimization.

Here are some key takeaways.

API adoption on the rise: The use of APIs is surging across industries, driven by factors like customer demand for seamless experiences, the digital transformation imperative and the increasing ease of API development.

Benefits of an API-led approach: A strategic approach to API integration creates a multitude of benefits, including streamlined data exchange, faster development cycles, improved customer experiences and greater agility in responding to market shifts.

Challenges and considerations: Although APIs offer significant advantages, challenges exist. Managing a growing number of APIs requires effective governance and a clear understanding of their purpose to help you avoid unmanageable bloat. Additionally, successful API implementation necessitates continuous collaboration between IT and business stakeholders.

API management and governance: Uncontrolled API growth and sprawl can lead to inconsistencies and heightened security risks while hindering agility. API governance establishes best practices and standards; API management tools help keep them in place. Together, they can produce more secure, efficient API use and foster innovation and agility.

The benefits of API reusability: By creating reusable APIs, organizations can eliminate redundant development efforts and cultivate a culture of innovation. This approach helps reduce complexity, improve integration efficiency and empower business users.



Climbing the API maturity curve: Organizations can progress through distinct stages of API-led connectivity maturity. Understanding these stages—unstructured, standardized and shared platform—is crucial for maximizing the value of APIs. A structured approach that promotes API creation, governance and self-service tools is key to reaching the most mature stage.

Unlocking API integration potential with IBM solutions: IBM offers a comprehensive set of integration offerings, including IBM API Connect, IBM App Connect and IBM webMethods, to help organizations establish a foundation, create and manage APIs, and benefit from the full potential of API integration.

In today's dynamic digital landscape, a strategic approach to API integration is no longer optional—it's essential for business success.

Ready to unlock the full power of API-led connectivity? [Book a live demo](#) to learn more about how IBM App Connect can help your enterprise achieve your integration and automation goals.

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1. Putting APIs to work: API-led integration strategies and considerations, IBM webinar at IBM TechCon 2024.
2. The 2022 API Security Trends Report, Noname Security.

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