

# Overcoming the chaos of connectivity

As part of ongoing research, webMethods experts spoke to 1,500 IT decision-makers around the globe as part of the Software AG [Reality Check](#)<sup>1</sup> to understand their technology challenges. That research uncovered turmoil, as companies continued to invest in new tech but often in silos and without an integration plan in place.

Over the last few years, 86% of businesses have substantially grown their tech stack, but half of them have done it without a clear integration plan, causing a “chaos of connectivity.” The research found that three-quarters of organizations agree that enterprise technology has become more chaotic over the last few years, creating significant challenges not only in terms of managing the technology itself, but in the impact such chaos has on the business—such as elevating risks in security, compliance, productivity, decision-making, and competitiveness.

While these challenges are significant, the good news is that they can be overcome. Organizations can manage the chaos of connectivity, but it’s important for them to understand where their technology chaos originates and how it mounts to execute an effective plan.

In 2020, there was a sharp acceleration in the investment in digital transformation initiatives. Previous research showed that companies began to see more technical debt as a consequence of that investment during 2021. Technical debt, defined here as the build-up of “post-go-live” recoding and technical

maintenance, can leave a considerable amount of necessary integration, security, and functional development work in a holding pattern. When that happens, chaos starts to take hold.

Moreover, the proliferation of enterprise technology solutions in just the last year has been enormous, thanks in large part to generative AI. While generative AI has the potential to drive massive business outcomes, it also adds significant complexity to the enterprise integration landscape, raising concerns about privacy, security, resiliency, and compliance.

If we look at OpenAI, GPT-1 worked from 117 million parameters; GPT-2 expanded to 1.5 billion, GPT-3 to 175 billion, and now GPT-4 to a reported 1.7 trillion. Of course, not every business is running systems that are this data hungry—but all technology is expanding. When technology expands quickly and there’s a lot of hype about its benefits, businesses face a choice: keep up or be left behind.

In the case of generative AI, organizations need to invest today because its potential is just too massive to wait. ServiceNow CEO Bill McDermott [told Fortune](#)<sup>2</sup> that this is the “iPhone moment” for the enterprise and that he “can’t think of a bigger risk than being a ‘fast follower’ in adopting generative AI.”

Goldman Sachs [estimates that AI investment growth](#)<sup>3</sup> doubled from \$40.16 billion in 2020 to \$110.19 billion in 2023—with significant growth expected by 2025 (~\$158.41 billion).



But as Software AG's primary research shows, many are investing without a plan to bring it all together. Integration will be the connective tissue that unifies data sources and feeds AI; when technology has the potential to affect the entire business, it must be integrated in a way that helps the whole business. But with each new system added and each new investment made, the risks of extending the technology chaos increase.

Take, for example, a manufacturing company that introduces new connected machinery on its factory floor. That information can be used by the machine engineers to monitor output, of course. But if that information is effectively integrated into other business processes, then it can be used by purchasing teams to monitor resource usage, by customer relationship teams to monitor delivery timelines, by operations teams to monitor machine maintenance schedules, and potentially more.

We've only scratched the surface of connectivity challenges among enterprises. This report will pinpoint the root causes of those challenges, their impact, and, ultimately, the opportunity that exists for enterprises ready to take the next step in integration. With this understanding, integrated enterprises can mitigate the chaos to become more agile, more productive, and better protected by stronger governance.

There is a chaos of connectivity across enterprises.

86%

have seen their tech stack expand substantially in the last few years

70%

have accrued more technical debt in the last 12 months than they have in previous years

42%

have invested heavily without a clear IT integration plan

## Chaos of connectivity: the context

The vast majority (86%) of companies have seen their tech stack expand substantially in the last few years. Nearly three-quarters (70%) have accrued more technical debt in the last 12 months than they have in previous years, and almost half (42%) have invested heavily without a clear IT integration plan.

The acceleration of tech investment prompted by the global pandemic was a second wind for digital transformation. As companies were forced to do more in a remote model, they supercharged their efforts to overcome technology challenges with innovative IT strategies. For example, setting up new e-commerce sites—perhaps a six-month project in normal circumstances—had to happen in a matter of weeks. Many elements of that mentality still remain: systems and applications that go live at a minimum viable product stage have the advantage of speed but also require frequent maintenance, development, and recoding later—i.e., technical debt management. In the case of an e-commerce spin-up, detailed requirements processes might be skipped with the goal of addressing them later. This isn't a problem when organizations have the resources to do it, but they frequently don't, which can create technology complexity.

As new systems become more widely used across the business, it's essential to integrate them effectively—whether for compliance, productivity, or sharing valuable information. That work can be time-consuming and complex, and current integration platform as a service (iPaaS) tools struggle with the new demands placed upon them. Companies that have perhaps gone live with a new e-commerce site in record time could be missing out on key connections between ordering and customer history systems, or between transactions and replenishment.

This technology challenge is not only ongoing, but growing. The majority of companies say that the number of disparate applications and systems has increased as compared to two years ago—and will increase again in the next two years. Therefore, the debt and the chaos created by new technology will only subside with a deliberate change in how these systems are managed.

## A new approach for new times

The conflict between business and IT is exacerbating the problem, with nearly half (44%) of organizations saying that this divide is worsening. This is nothing new, of course, as organizations have faced challenges with citizen developers and shadow IT for many years. However, generative AI has suddenly leveled up the technical skills of many within an organization: anyone with internet access now has the ability to develop something new. Most employees have a greater awareness of the power of technology, if not the skills and experience, making relationships between line of business users and IT even more fractured.

Consider the pressures on all parts of a business—be it for more sales, faster product development, or simply improved efficiency—and you can understand why more and more teams want to move quickly: if lines of business don't get what they need from IT immediately, they start doing things themselves.

There are other digital transformation challenges contributing to this technology chaos. For example, nearly half of organizations (44%) have multiple vendors for their different integration needs, which means they need to integrate their integration tools—something that only worsens in the context of application sprawl. More than two-thirds (69%) of organizations have a higher number of disparate applications now as compared to two years ago, with even more (71%) believing that will increase in the near future. There's no slowdown in sight. Times are changing, and so must an organization's technology strategy.

The reasons for the growing chaos of connectivity are myriad: while some of the environmental factors may not change, organizations can look at the consequences of these changes in the context of their businesses and resolve to reverse the trend toward chaos going forward.

## Chaos of connectivity: the risks

The technology challenges created by complexity and the resulting chaos will be felt throughout the business. However, the risks created by the chaos of connectivity are the bigger concern: if the growth of technology continues without a new approach to its management and integration, there could be significant commercial, compliance, and business implications.

### Slipping into noncompliance

One of the greatest threats of the chaos of connectivity is non-compliance with regulations or standards; nearly two-thirds (65%) of companies have governance issues that are made worse by technological complexity.

There are many possible reasons for this, but they all stem from the same problem: a disconnect between the necessary systems and data to maintain and/or demonstrate compliance. Eight in 10 companies would define the majority of their systems as "legacy," and nearly half of companies (44%) find co-managing new and legacy systems increasingly complex. Highly regulated industries in particular, such as governments or financial services, have significant investments and business-critical information stored in mainframes and other more commonly "closed" systems. While the stability and security of this setup is usually a huge positive, that's not always true when it comes to issues such as data regulation or operational resilience: here, it can be hard to prove that data or processes are compliant without any tools that unite all the systems.

Generative AI is an even bigger potential black-box architecture. Adhering to data sovereignty laws when you don't know exactly how your data is being transmitted, nor to whom, is only getting harder. Therefore, it has become essential to find ways of figuring out which of your business users have hopped on the AI train independently, yet without any signs of implementing proper governance. To overcome this technology challenge, you need tools to help identify whether critical data, strategies, and reports are being fed to unsecured AI plugins. Moreover, you must ensure that key decisions are being made based on reliable information and that security is not negatively impacted by any flaws in AI-influenced decision-making.

Shadow IT adds to the chaos—and it's getting worse.

44%

say the divide between business and IT is getting worse

Governing disconnected systems is a problem, and organizations can easily slip into noncompliance.

65%

feel governance issues are made worse because of technological complexity

The chaos of connectivity is putting key business performance at risk.

80%

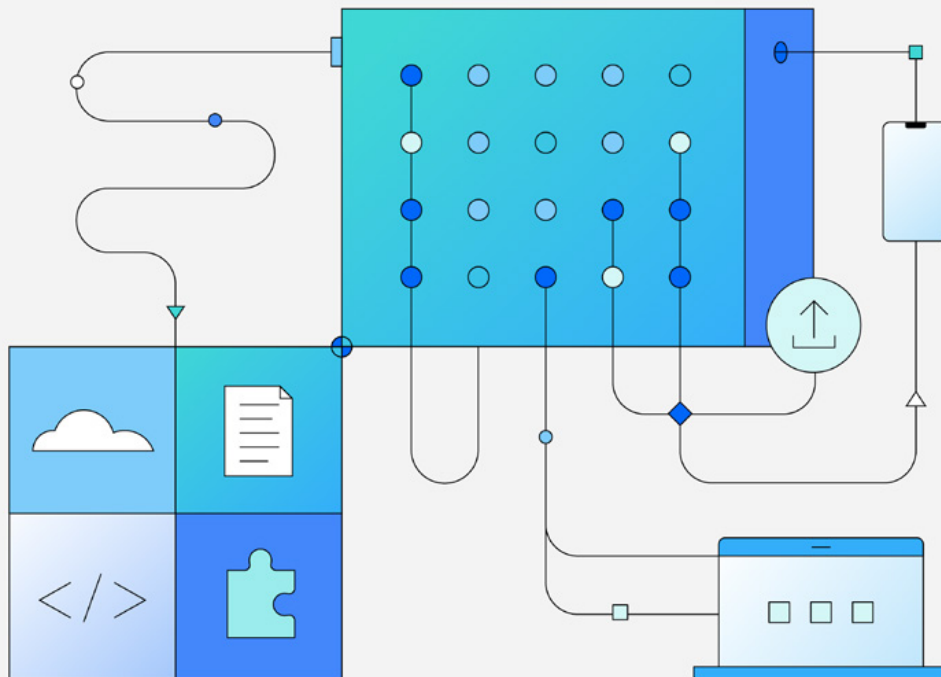
feel that size of their tech landscape makes them less agile, slowing the ability to launch new products and services, improve customer and employee experiences, and increase revenue and profitability

### Losing competitiveness

Every organization is under pressure to be more competitive. This often means being quick to act, whether within product development, customer service, or simply financial terms. However, 80% of companies believe complex technology can actually slow the increase in revenue or profitability, the launch of new products and services, or the improvement of customer and employee experiences. The chaos of connectivity is putting key business performance at risk.

If businesses don't integrate all their data, their analysis is incomplete. This means that decision-making can stall—they either can't act or must make poorly informed decisions. Half of companies (47%) believe that key data is simply inaccessible when they need it; a similar number (46%) feel that decision-making is slower because data is hard to migrate from legacy systems.

In a perfect world, all data should be available in a few clicks, but it's not—and organizations consequently miss opportunities to change, move into new markets, and win new customers. In the long run, this can erode competitiveness in a way that's hard to recover.



### Losing revenue

While there's a risk to a company's long-term strategy and market position, there are also immediate risks to businesses in the form of disruption and stoppages that reduce revenue. Nine in 10 companies (89%) have experienced disruption or been forced to shut down services because of technology issues; 22% say it happens often.

There is an immediate impact on sales and other transactions when they simply can't be processed. Technology does crash occasionally, but understanding why service stoppages occur is a key component of managing the risk of further disruption. Half of companies (51%) have seen disruption caused by overloaded apps unable to respond and shutdowns resulting from compliance problems with public-facing services.

### Being unproductive and wasteful

Almost half of companies (45%) experience conflict in decision-making resulting from duplicated processes caused by informational and/or operational siloes. It's easy to see how this can happen as teams throughout the business become more empowered by technology: they create their own data, decisions, and subsequent ways of working. But it's all being done in isolation, with no connection to the rest of the business.

Business disruption is a problem.  
When systems go down,  
companies can lose customers.

89%

have experienced disruption or have been forced to shut down services because of technology issues (22% say it happens often)

51%

have seen disruption caused by overloaded apps unable to respond as well as shutdowns resulting from compliance problems with public-facing services

This means that companies are busy with many, often well-meaning, endeavors, but when it comes to crunch time, it's hard to take the final step. Disagreements occur late in the process—instead of coordinating at the beginning—because there isn't a central point of visibility and management of all these systems to alert teams to the existence of others working on similar things. For example, a single, central [API management tool](#) could enable business leaders to see every department that's tapped into certain applications or data to ensure collaboration.

Productivity issues can be compounded by the technology intended to solve those very issues. Just under half of companies (44%) use multiple vendors for their different integration needs. This is likely where organizations need to integrate data, applications, B2B platforms, APIs, and event streaming, but today's iPaaS solutions cannot cover them all in one platform. And of those companies that do utilize multiple vendors, the majority have high license and maintenance costs (58%) and find it difficult to enforce standards and best practices (51%).

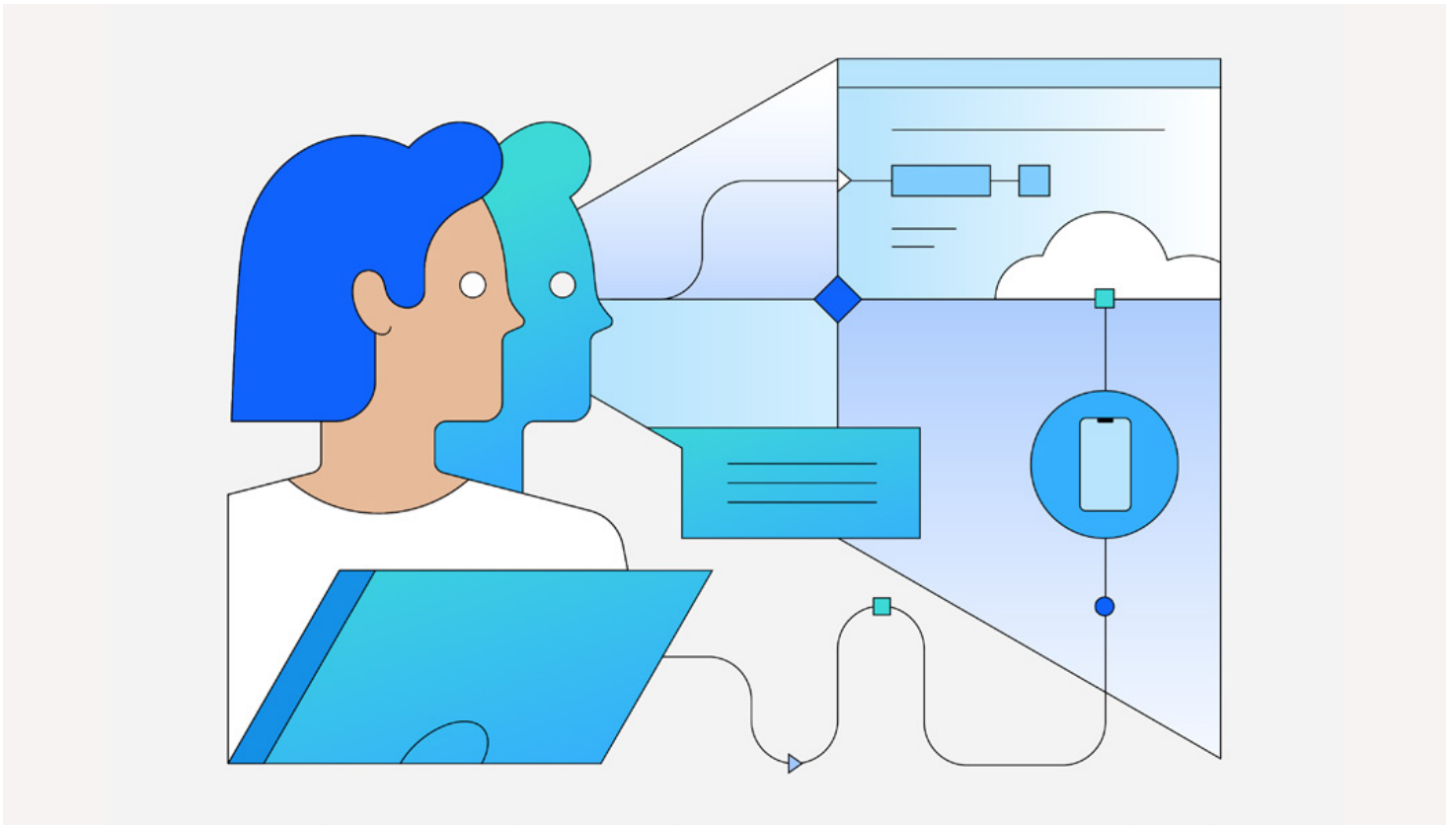
### Security

Cybersecurity around digital transformation is an obvious, visceral risk that companies face. As technology infrastructure sprawls, it generates more potential attack vectors in an environment where it's difficult to monitor them. This trend is not slowing, as organizations still need to roll out new products and services. Some steps, such as [centrally managing all APIs](#) to ensure consistent standards and effective monitoring, can help. However, there are also other security elements in play, in particular around business continuity. The pace of technology change is outstripping the development of suitable skills in nearly half (46%) of organizations. Not only does this make it a challenge to tame the technology chaos in today's enterprise, it also suggests that the problem will get worse going forward unless IT teams take immediate action.

New tech is being introduced  
faster than new skills can be  
developed or hired.

46%

say the pace of technology change is outstripping the development of suitable skills in their organizations



The threat doesn't simply come from failure to keep up with new technology—some businesses are facing a growing risk of being unable to keep up with old technology. As workers skilled in older coding languages retire from the workforce, or simply move to new roles or different organizations, businesses will find it harder to maintain critical integrations and other fundamental elements of key systems.

### **Risky business**

There are a number of problems facing businesses as a result of disconnected data, unclear management tools, disparate skills, and siloed systems. However, these issues can be overcome with the right approach to integration.

## **Chaos of connectivity: overcoming complexity**

Companies are exposing themselves to new and mounting risks just by continuing to invest in technology. However, the benefits of new tech outweigh—or at least should outweigh—the risks.

The chaos of connectivity requires organizations to look at their strategy for managing technology in a new way: with a clear integration plan in place. When they do, they'll see improvement in their agility, productivity, and governance. The solutions available for integrating the increasingly disparate and rapidly expanding technology landscape affecting today's businesses simply don't cut it. A new category of integration technology is needed.

So, how and where can companies look to improve the key areas of agility, productivity, and governance?

As organizations tech stacks grow, their agility suffers.

80%

feel that the size of their tech landscape makes them less agile

Inefficiency is a problem. Organizations are still mired in data silos.

81%

have duplicate integrations because of siloed working environments

### Agility

Eight in 10 (80%) companies believe the size of the tech landscape makes them less agile. They feel they cannot move quickly to adapt to the technology landscape or to market opportunities. Behind the scenes, this is a downward spiral: on one hand, the chaos makes it harder to make sense of the tech landscape, which in turn slows things down—yet seemingly, the only way to manage that is to enforce a very specific set of standards or processes for future development. On the other hand, you see teams and departments building their own tools, launching faster, and circumventing IT backlogs. The long-term outcome of these opposing trends is more technology chaos.

This is exemplified by pockets of integration developing within a business, which happens in 86% of organizations. They end up with multiple platforms, teams, and lines of code living across multiple clouds, systems, and geographies. This is problematic because most companies affected by the chaos of connectivity don't have the tools to manage it—or even know about them.

A unified platform across [data and application integration](#) creates a seamless flow of data, allowing you to make decisions utilizing your data and implement them immediately. This means that even if there are disparate pockets of integration or siloes of activity, they're not operating independently or creating problems at a time when action is critical. With a unified platform in place, you can grant employees the freedom to develop integrations using any tools that individuals or teams prefer to use. Isolated pockets of integration become a thing of the past, but not because of tighter control—in fact, developers are given freedom, allowing them to deploy in any cloud or region in a single click.

### Productivity

All businesses are under pressure to do more, often with less. The answer, then, is to get more done together, with less work. Eight in 10 (81%) businesses know that they have duplicate integrations because they've siloed working environments. Imagine these teams having more visibility regarding what others are doing: not only will they subsequently need to do less themselves, but the value of the work done by one team only increases because they've built something everyone can use.

A unified integration platform means the learning curve for teams is less steep, yet they can collaborate more than ever—building applications and experiences and then deploying them as APIs in a single motion.

This freedom to operate and collaborate in a more efficient manner leads to productivity in other ways as well: it can boost business technologists' productivity by allowing them to automate workflows themselves, especially coupled with generative AI. Instead of creating more technology chaos, these new integrations can be centrally managed, helping the 82% of businesses for whom shadow IT is a problem. Such freedom also helps resolve the conflicts between IT and lines of business that characterize app deployment in 80% of organizations.

## Governance

Governance is a topic that covers a broad range of issues and risks. Global data regulations, specific industry standards, and pieces of legislation are all major considerations that must be adhered to. While the complexities of legislation can vary, the core of the solution is common to almost all of them: visibility and management of data and technology boosts compliance.

Eight in 10 companies (81%) say that a major pain point is not having a clear view or comprehensive management of all integrated systems, making it difficult—if not impossible—to ascertain the status of each. Therefore, such organizations need an entirely new set of tools for better governance.

Centralized control and distributed execution mean that integrations can run anywhere, with a central point of governance. Coupled with a “single pane of glass” across these integrations, APIs, and data pipelines, organizations will now have end-to-end visibility across all transactions.

A unified experience for all integrations delivers complete observability and offers compliance without chaos.

Business leaders are losing sleep over data regulations.

81%

say that a major pain point is not having a clear view/management of all integrated systems

## Chaos of connectivity: a path to success

Simply put, the chaos of connectivity makes it difficult for businesses to capitalize on the value trapped in their data. Of course, no one chooses not to share data or refuses to collaborate or unify their technology—you only do it if you’re stuck.

You may have invested in feature-rich integration suites, but you’ve found they’re so complicated that only your IT team or data engineers can use them. So, you have high demand for your integration experts, but lack the supply.

Alternatively, you may have invested in an iPaaS as a point solution for business teams who don’t have time to wait in the IT queue. You let them create the integrations and automations they need—but left unregulated, this can result in an uncoordinated web of systems, with the ensuing complexity leaving you feeling like you’re “too big to innovate”: too busy trying to make sense of what’s been created and unable to use that new data to make improvements across the business.

IBM webMethods provides a hybrid enterprise integration platform that serves as a unified interface for all of your integration patterns—application, API, event streaming, and B2B—across all geographies, hybrid multicloud hosting environments, user personas, and teams.

Instead of integration chaos, you have a single, centrally managed integration platform with end-to-end visibility that can be used by everyone across your enterprise—allowing you to rapidly adapt to your technology needs, answer business requests quickly, and wield exacting control over every integration across your business.

[Learn more at ibm.com/webMethods](https://ibm.com/webMethods) →

1. 2024 Reality Check: A Chaos of Connectivity Is Putting Businesses at Risk, Software AG, 2024.
2. ServiceNow CEO Bill McDermott says there's no bigger risk than being a generative AI 'fast follower,' Fortune, 26 October 2023.
3. AI investment forecast to approach \$200 billion globally by 2025, Goldman Sachs, 1 August 2023.

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