HARVARD BUSINESS REVIEW

Building Tax Determination into ERP Modernization

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From ERP Transformation to Operational Resilience: Why Tax Must Be Designed In

Enterprise resource planning (ERP) modernization is at the top of the agenda for finance, IT, and transformation leaders worldwide. Cloud adoption, real-time data, and process standardization promise greater agility and efficiency across the enterprise. Yet one critical capability—automated indirect tax determination—is still too often treated as a downstream consideration rather than a core design requirement. This gap between modernization ambition and execution reality is one of the challenges this report explores.

Across industries, we see organizations investing heavily in ERP transformation without fully factoring in how taxes are calculated, governed, and sustained within those systems. At the same time, the indirect tax environment is becoming more complex and less forgiving. Continuous transaction controls, digital reporting mandates, and transaction-level validation are expanding rapidly across jurisdictions. These requirements place unprecedented demands on data accuracy, system integration, and timing—demands that manually maintained or legacy tax configurations within ERP systems were never designed to meet.

At Vertex, we view this moment as a strategic inflection point. Indirect tax no longer functions solely as a compliance obligation; it is deeply embedded in revenue recognition, cash flow, and customer-facing processes. As organizations modernize ERP environments, early architectural decisions increasingly determine whether tax determination can be automated, scaled, and sustained—or whether it becomes a source of operational risk, manual workarounds, and costly retrofits.

The report's findings align closely with what we observe in the market every day. It highlights that leading organizations integrate tax determination into ERP modernization initiatives from the outset—aligning data models, governance, and ownership across tax, finance, and IT teams. They treat tax as a shared enterprise capability rather than an isolated function. As a result, they are better positioned to respond to regulatory change, preserve business continuity, and reduce long-term complexity.

This research also reinforces an important distinction. Success is not about choosing ERP-native functionality versus external solutions in the abstract; it is about end-to-end architectural alignment. Organizations that integrate purpose-built indirect tax determination technology into modern

Gunjan Tripathi
EMEA Director, VAT and Tax Technology
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ERP environments early can establish a stronger foundation for accuracy, transparency, and adaptability as regulations, data requirements, and business models evolve.

Vertex is proud to sponsor this Harvard Business Review Analytic Services white paper because it reflects the conversations we are having with organizations navigating ERP modernization today. As transformation accelerates, the question is no longer whether tax should be addressed but when and how. Organizations that elevate tax to a core design principle will be better equipped to scale globally, adapt with confidence, and turn compliance from a constraint into an enabler of resilient growth.

Building Tax Determination into ERP Modernization

As organizations modernize enterprise resource planning (ERP) and finance systems, indirect tax is often addressed late in the process despite its deep reliance on transactional data and its direct impact on revenue, compliance, and operational resilience. The growing number of rules and rates for value-added general services and sales and use tax regimes, and the pace at which they change, have increased pressure on how taxes are calculated and managed within core systems.

BECAUSE TAX OUTCOMES depend on how data is captured, governed, and integrated across enterprise systems, early ERP design decisions increasingly determine whether tax determination can be automated and sustained. The alternative is to rely on reactive manual processes.

Yet many organizations still rely on outdated mechanisms to determine tax rates, using manually updated rates and tables within ERP systems. Those that still rely on fragmented and reactive technology environments create compliance gaps and increasing dependence on manual intervention—an approach that becomes unsustainable as reporting mandates accelerate.

"Tax is a large part of the corporate finance function, yet a lot of systems were implemented without it being a priority," says Michael Charette, a partner at RSM Canada LLP, a consultancy based in Toronto. "Once you've implemented an ERP system that way and start looking downstream for applications, making changes to the core functionality is really difficult. It's just bad practice. You're opening yourself up to risk."

As transaction-level reporting and validation requirements expand, ERP design and tax determination

HIGHLIGHTS

Many organizations **still rely on outdated mechanisms to determine tax rates**, using manually updated rates and tables within enterprise resource planning (ERP) systems.

Tax software put in place after an ERP implementation or late in the process **often struggles to meet compliance challenges and, because it can't keep pace with ERP upgrades**, ends up creating fragmented data and requiring costly custom integrations with data sources.

To thrive in this increasingly challenging compliance environment, **organizations should consider advanced indirect tax technology** and the means of ensuring the accuracy, timeliness, and visibility of their data.

> “Tax is a large part of the corporate finance function, yet a lot of systems were implemented without it being a priority.”
>
> Michael Charette, partner, RSM Canada LLP

capabilities increasingly determine whether organizations can meet compliance obligations without manual work-arounds, reporting delays, or operational disruption.

The challenge is not the use of modular or external tax solutions per se but whether tax and reporting capabilities are architecturally aligned with ERP modernization efforts. When compliance requirements are left to be addressed late in the ERP modernization process, organizations often face fragmented data flows, delayed reporting, audit exposure, and costly retrofits.

“It’s a best practice [for the ERP system] to get upgraded at the same time as some other big technology change,” notes Robert Clarke, managing director for global indirect tax and technology at the Chicago-based consultancy Grant Thornton Advisors LLC. Clarke notes that, for one thing, doing so enables an organization to implement the latest version of tax technology solutions. For another, “you don’t have to patch together an old system to make things work in the interim.” He likens the approach to surgery. “We tell clients, ‘Let’s do it all now, while the patient’s open,’” he says.

This report will explore the value organizations can realize by implementing advanced indirect tax technology in ERP systems at the outset of modernization efforts rather than bolting on solutions as requirements change, the challenges that prevent organizations from doing so and the consequences of failure, how organizations can overcome those challenges, and how they can best implement, upgrade, and maintain such systems.

Meeting the Compliance Challenge

Not all digital reporting regimes place the same demands on enterprise systems. Government-mandated continuous transaction control models, which are increasingly in use around the globe, require transactions or invoices to be approved by tax authorities before or at the point of issuance, while other regimes mandate rapid post-transaction reporting or the periodic submission of standardized audit files. Each approach has different requirements for data accuracy, timing, and system integration—making early architectural decisions critical.

But all these approaches are based on the electronic submission of transactional data from taxpayer systems to a platform designated by the tax administration. The submission takes place just before, during, or just after the actual exchange of such data between the parties to the underlying transaction. And if the authorities find any discrepancy, they can delay the receipt and recognition of cash and revenue. Even if there isn’t a discrepancy but the government system is down, business continuity—and with it revenue generation—could be interrupted on a day-to-day basis.

In such an instance, “your customer is not paying, so it disrupts your whole liquidity planning,” says Steef Huibregtse, CEO and founder of Transfer Pricing Associates (TPA Global) BV, an Amsterdam-based consultancy.

In addition, the organization puts itself at risk with taxing authorities. “Because tax touches revenue and customer-facing processes, these issues can quickly affect billing accuracy, cash flow, and business continuity while putting the organization at risk of noncompliance and reduced audit defensibility,” says Maria Montenegro, CEO of the corporate finance and environmental, social, and governance division of Wolters Kluwer NV, a consultancy based in Alphen aan den Rijn, Netherlands.

The growing compliance challenge is reflected in the findings of a report by consultancy Deloitte titled “Meeting the Moment: Tax Transformation Trends, 2025.”[1] Forty percent of the 1,000 tax and financial professionals surveyed by the firm ranked their ability to comply with tax laws and regulations as their top challenge over the next three to five years, followed by the challenges of quantifying tax implications of alternative scenarios, access to talented tax professionals, integrating tax-related data, and difficulty aligning with transformation strategy. FIGURE 1

These challenges are especially formidable for companies operating across borders, simply because of the sheer volume and variety of regulations facing organizations. "You have huge global supply chains, tariffs, value-added tax, and all these different regimes," RSM's Charette says. "It's easier when you're working in one country, but once you become a multinational, it's a complex web to navigate." Meanwhile, more and more states and nations are taxing digital purchases, meaning rising e-commerce volumes are increasing the number of taxable events.

Even domestic compliance is increasingly challenging. Brazil, for example, has thousands of different tax authorities at the municipal level. And while the U.S. imposes relatively simple sales tax instead of the more complex value-added and general services taxes, sales tax can still create compliance headaches, as there are different rules for reporting it within more than 13,000 U.S. jurisdictions, including municipalities and special districts in addition to state and county tax authorities.

The challenge of dealing with multiple geographic jurisdictions, domestically or internationally, lies in understanding what TPA Global's Huibregtse calls "the full cycle of logistic movements." As he explains, "You need to see the invoice flow, you need to see the cash flow, you need to see where the legal title transfers from one entity to another."

Huibregtse estimates that there are at least five or six such geographic variables that an indirect tax platform must deal with for each transaction, and he contends that the simplest ERP systems are not always capable of capturing those in their totality. Moreover, if an advanced tax platform isn't well integrated into an ERP system, manual intervention is required yet slows compliance and is error-prone.

Benefiting from Upfront Integration

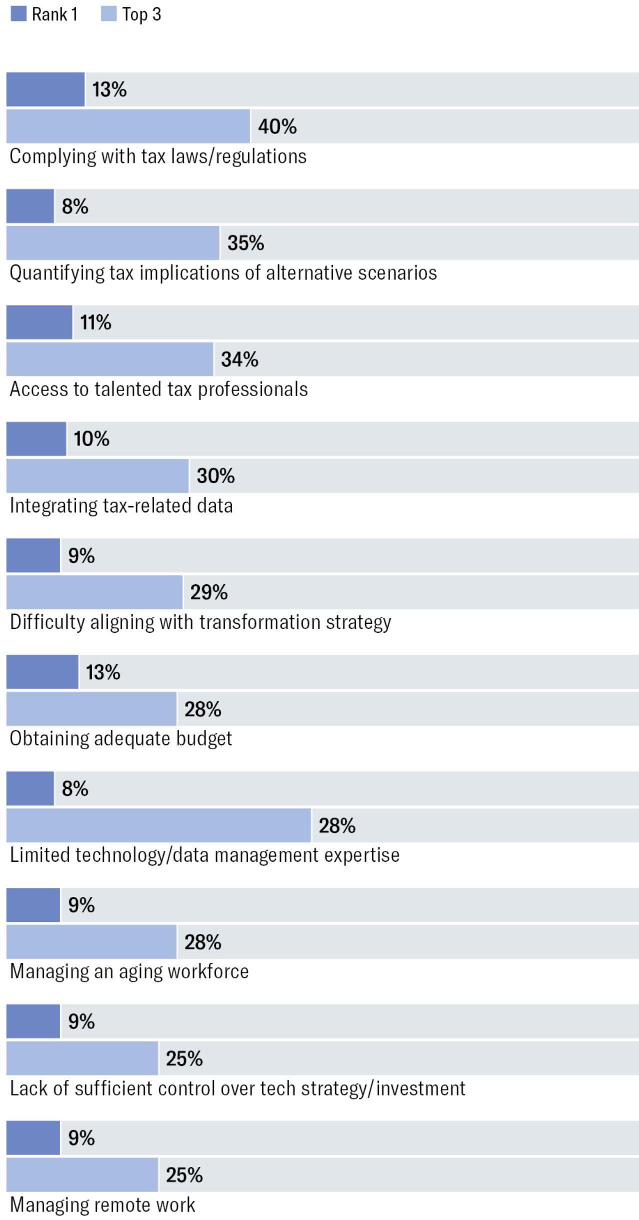
Tax software put in place after an ERP implementation or late in the process often struggles to meet compliance challenges and, because it can't keep pace with ERP upgrades, ends up creating fragmented data and requiring costly custom

FIGURE 1

Top Tax Challenges

Compliance, quantification, and talent are practitioners' top tax concerns in the near-to-medium term

Percentage of respondents who ranked the challenges as either their top challenge or among their top three over the next three to five years



Source: Deloitte survey, February 2025

> **“When tax compliance considerations sit too far downstream, organizations often end up paying twice—once to transform, and again to make the environment compliant and resilient.”**
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> Maria Montenegro, CEO, corporate finance and environmental, social, and governance division, Wolters Kluwer NV

integrations with data sources. Those drawbacks can lead to inconsistent data and reporting and require manual updates for each jurisdiction. Such manual intervention not only is costly but also can lead to compliance gaps.

Patchwork systems can update automatically to accommodate regulatory changes, but they often face delays due to the relatively slow speed at which they work or latency, particularly when retrofitted to older ERP systems, according to Grant Thornton’s Clarke. A major reason for these shortcomings is that such solutions isolate tax processes, leading to fragmented workflows, misaligned priorities, and ultimately complicated upgrades.

What’s more, adding solutions onto an ERP system after or late in the implementation process often involves the significant duplication of previous efforts, if only because personnel have changed. All kinds of information are in an organization’s ERP system, such as in a general ledger or a point-of-sale (POS) system as well as a stock-keeping unit. “All of those things have to be considered and mapped properly into a tax application,” Clarke says. If that’s done at the same time, “you’re doing them once instead of twice.”

Wolters Kluwer’s Montenegro emphasizes that the duplicative nature of add-on solutions is costly. “When tax compliance considerations sit too far downstream, organizations often end up paying twice,” she says, “once to transform, and again to make the environment compliant and resilient.”

Yet many organizations are plagued by problems arising from add-on solutions. Clarke cites “tons of stories where companies, including large multinationals, piece things together until they get funding or decide to actually do the tax transformation piece, and it’s always less efficient. It takes longer. And you have another change management cycle. We see it all the time. It takes more time, more resources, more costs.”

In addition, if tax isn’t integrated at the outset of modernization, you create key person risk. “If the only individual who understands the tax setup leaves, the next person often has to start from the beginning,” Charette notes. “But if tax is part of the initial build, the tax processes are part of the documentation—that is, the technical design for tax is part of that. And now you don’t have to figure that out.”

Elevating Tax to a Strategic Level

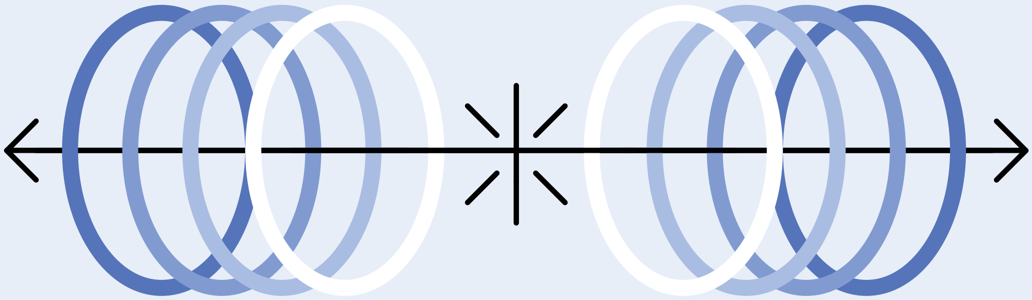
Many organizations lack effective tax integration in their ERP systems because they suffer from a disconnect among their tax, IT, and finance teams, which hampers operations as well as compliance. Ideally, chief information officers should view tax compliance as a core design requirement, not a “downstream validation step,” as Montenegro puts it. “In large ERP programs, technology decisions are inseparable from operating model decisions. That includes who owns data definitions, how controls are enforced, and how changes are governed over time as regulations evolve.”

But if tax people aren’t communicating that message to the organization’s board, “it will not support you,” Huibregtse says. “Then you’re lost, and you’ll have to do the bolt-on.”

Here organizations may benefit from having business analysts participate in such discussions, he continues, especially if they can explain the risks of noncompliance, such as losing a license to operate or having cash flow disrupted. If they can communicate to the board how those risks can be mitigated through data flows, thanks to effective tax integration into ERP systems, then the organization can find stronger collaboration among IT, finance, and tax teams by creating a shared real-time view of tax data and compliance processes.

Those benefits are easily enumerated. When a centralized tax control framework is embedded within core systems, each function works from the same accurate and up-to-date information, reducing silos and miscommunication. IT teams benefit from standardized integrations that simplify maintenance and reduce workarounds, while finance gains confidence in data accuracy for reconciliations, forecasting, and core processes such as procure-to-pay and order-to-cash.

Tax departments, in turn, can shift focus from manual corrections to strategic activities such as identifying savings, optimizing supply chains, or assessing the impact of new



“If the only individual who understands the tax setup leaves, the next person often has to start from the beginning.”

RSM’s Charette

Keeping up with the scope and pace of ever-changing regulations is clearly the chief hurdle facing organizations when integrating tax determination and compliance into their ERP systems.

markets, acquisitions, and mandates. Ultimately, a proactive tax integration solution elevates tax from a back-office function to a strategic business partner, aligning tax strategy with corporate goals, technology modernization, and growth initiatives. It enables organizations to view tax compliance not as a burden but as a driver of efficiency, insight, and global readiness.

"The core of it at the end of the day is, 'How do I get all of the information I need for all of these decisions into a place that's accessible and secure?'" says Charette. And while secure consolidation of tax information requires data integrity but is now technologically possible, he notes that "there's a huge amount of strategy around it. Virtually every business decision has a tax consequence."

Overcoming Hurdles

Keeping up with the scope and pace of ever-changing regulations is clearly the chief hurdle facing organizations when integrating tax determination and compliance into their ERP systems.

The flux in indirect tax rules is simply a constant, notes Mo Huda, a principal in the Dallas-Fort Worth office of Baker Tilly US LLP. "They're always changing," says Huda, "and someone has to monitor those things. I'm not going to say that's impossible [with a manual system] because you can brute force your way in. But with a dedicated tax engine, a team of researchers is constantly monitoring and updating the rates, rules, and all that."

Organizations frequently cite skills gaps and underestimated complexity as barriers to modernizing tax and compliance processes, particularly in large ERP environments. And bolt-on solutions don't help matters. "When organizations modernize ERP or migrate to the cloud, they are fundamentally redesigning how the enterprise operates," Montenegro notes. "But when tax compliance requirements are an afterthought rather than designed from the start, organizations often find themselves retrofitting controls into live processes. The result? Cost, delays, disruptions."

The talent shortage is also a formidable obstacle, with 34% of the tax and finance executives surveyed by Deloitte citing access to talented tax professionals as one of their top three challenges in the next three to five years. Tax technology "is a niche space that requires certain years of experience and training," says Baker Tilly's Huda. "They don't teach it in schools."

Organizations are seeking to cope by adopting low- and no-code software platforms, managed services models, and artificial intelligence (AI)-driven automation tools. Still, Huda cautions that training personnel knowledgeable in indirect tax will still be necessary. "AI is going to expedite the [compliance] process," he says, "but it doesn't change the need for specialized training."

Realizing Success

Clarke identifies three basic requirements for tax compliance success and the use of integrated tax technology for achieving it.

The first requirement, says Clarke, is the accuracy required for a tax system's two basic components. One component involves compliance, and the other regards calculation capabilities, where a POS system, for example, pings the tax engine, and it comes back with the right tax rate and whether it's taxable or exempt. Yet the tax engine also must deal with certain wrinkles. If an item is taken out of inventory for internal use instead of sold, for instance, that might turn the item from exempt to taxable to the organization itself—or if it's purchased for manufacturing purposes, it might do the reverse. Then this proper taxability for an organization's transactions must be reported to the proper jurisdiction in a timely manner.

The second requirement is efficiency, as organizations' tax engines must also produce "aggregated, cleansed, return-ready" data, says Clarke. "You don't want to be preparing your returns a couple of days before they're due." By the same token, he says, "you also likely don't want to have a voluminous number of people working on your sales tax returns after tax calculation determinations are made because they're manually going to 10 different systems to pull inconsistent data elements and formats required for compliance." In that case, he explains, "they're probably extracting data and playing with it in Excel." But they shouldn't be doing that, he insists, "not when there are technology tools where you can automate all of that, ultimately in a more cost-effective manner."

The final requirement, Clarke says, is visibility. Until advanced technology became available, he says, companies "didn't know what they didn't know until they received a tax audit notice and discovered from a tax authority that they were not compliant." What's needed to understand knowledge gaps in advance are peripheral devices around tax engines and compliance processes, such as dashboards that can help organizations understand cause and effect, he explains.

More generally, Albert Bomer, a professor of tax and technology at Vrije Universiteit in Amsterdam, recommends that companies adhere to the framework for maintaining internal controls for tax compliance developed and maintained by the Committee for Sponsoring Organizations, a private-sector initiative formed in 1985 in the U.S. to improve corporate governance, financial reporting, and internal controls. The framework sets forth standards for five categories of indirect tax management: the control environment (i.e., the tone at the top, the organizational structure, and competence); risk assessment (i.e., the economic and physical "nexus," legislative monitoring, and materiality analysis); control activities (i.e., the use of automated tax engines, exemption management, and reconciliations); information and communication (i.e., data integrity and internal reporting); and monitoring activities (i.e., internal health checks and continuous improvement).

Charette contends that the continuous improvement of organizations' indirect tax function is particularly key.

> "AI is going to expedite the [compliance] process, but it doesn't change the need for specialized training," says Mo Huda, principal at Baker Tilly US LLP.

"Finance transformation is not a one-time event every five years," he says. "Agile organizations set up a laundry list of things they want to do. They're constantly reprioritizing."

Getting Data Right

Of course, the most advanced, sophisticated, and well-integrated technology alone won't produce an outstanding tax function. Montenegro points out that "inconsistent data" is a major challenge, explaining that "different regions and business units often define products, services, customers, and transactions differently. Without harmonized data foundations, tax compliance logic behaves inconsistently, even when organizations believe they are running standardized processes."

As Huibregtse puts it, "You don't want dirty fingers touching the data and making it less reliable," adding that those "fingers" typically originate in the finance or IT departments. But that issue, too, is more easily avoided when tax is well integrated into an ERP system.

Huibregtse suggests that extract, transform, and load (ETL) tools and solutions that some experts recommend for data gathering, management, and governance might not be necessary when a tax engine uses the cloud along with AI. As he describes it, ETL and cognitive learning tools "push" data, whereas the AI-enabled cloud system "pulls" it. He contends the latter approach may be more economical because it can handle unstructured data. "You can pull data even if it's unorganized," he says, "even from emails from 10 years ago."

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> Steef Huibregtse, CEO and founder, Transfer Pricing Associates BV

Huda agrees that the cloud “definitely helps” with data gathering, management, and governance. “It creates a lot more robust infrastructure in terms of access to, use of, and scalability of data.”

Looking Ahead

Sophisticated cloud-based tax technology may best be integrated into organizations’ ERP systems at the outset of their modernization to cope with the increasing demands of indirect tax compliance. Indeed, besides collecting more detailed data and demanding it more rapidly, tax authorities globally are also using more-sophisticated data collection techniques, increasingly with the help of AI, across the wider business.

Audits are also becoming more data-based, enabling tax authorities to employ analytics on that data, which in turn helps them decide what types of audit sampling methodologies to engage in. “They are not interested in your opinion. They are not interested in a report,” Vrije Universiteit’s Bomer asserts. “They say, ‘Give us your data. We’ll check it and let you know.’”

To thrive in this increasingly challenging compliance environment, organizations should consider advanced indirect tax technology and the means of ensuring the accuracy, timeliness, and visibility of their data. Doing so means looking ahead and anticipating change, says Charette, pointing to the need for good data practices to take advantage of the growing AI capabilities of tax technology. “You have to ask yourself, ‘What data am I feeding these tools, and am I maximizing the value of these new capabilities?’”

Because robust, well-integrated tax technology is better able to adapt to change, it can help meet future as well as present compliance and operational needs if it’s part of any overall digital transformation effort. “Embed tax compliance into the transformation narrative from the start,” says Montenegro. “When tax compliance is treated as a constraint, it slows progress. When it is designed into the system and operating model, it becomes an enabler that allows the business to scale, expand globally, and operate with resilience.”

Endnotes

1 Deloitte, “Rising to Meet the Moment: Tax Transformation Trends, 2025,” February 2025.

Indirect Tax Integration Matters in ERP Modernization

The finance function is evolving. CFOs are no longer gatekeepers of historical data—they are architects of business resilience and growth. Yet many organizations treat indirect tax as a compliance afterthought, siloed from core business operations and disconnected from enterprise systems. This fragmentation creates blind spots that cascade across the organization, from cash flow disruptions to missed optimization opportunities to audit vulnerabilities.

Consider the finance leader forecasting demand, setting growth investments, and modeling supply chain scenarios. Each scenario has tax implications, different tariff treatments, varying indirect tax obligations, and distinct cash flow impacts depending on where products are sourced, shipped, and sold. Yet those tax implications often remain invisible, buried in manual calculations disconnected from the enterprise resource planning (ERP) systems driving the actual business. The result: strategic decisions made without full visibility into their true financial impact, compliance risks that emerge only during reporting cycles, and finance teams caught between competing pressures to drive growth and ensure resilience.

The challenge intensifies for multinational enterprises. Organizations must navigate complex webs of regulations across thousands of jurisdictions, understand the full cycle of logistic movements for each transaction, and manage real-time calculations across multiple tax regimes. Tax authorities worldwide are tightening requirements and accelerating timelines. In this environment, indirect tax is no longer a back-office function; it is operationally critical. When tax processes are disconnected from procurement, finance, and supply chain systems, organizations create manual workarounds, data inconsistencies, and compliance risks that ultimately threaten revenue recognition and business continuity.

If companies modernize their core ERP systems with indirect tax treated as a downstream afterthought (something to be addressed after the new platform is live, after the data has been migrated, and after the process redesign is locked in place), the result is predictable: fragmented data flows, manual workarounds, compliance gaps, costly retrofits, and—most troubling—tax functions that remain reactive and operationally fragile even as business demands accelerate.

When indirect tax is embedded into an integrated ERP platform—connected to supply chain planning, procurement, order-to-cash, and financial planning processes—tax implications are visible to every strategic decision, tax compliance is automated rather than manual, and tax professionals can shift focus from back-office reconciliation to strategic value creation.

At SAP, we believe that modern ERP systems must be tax-intelligent systems. Tax must be architected into the core platform, integrated into transactional workflows, embedded in data governance frameworks, and supported by continuous regulatory monitoring and AI-driven compliance capabilities.

This white paper explores why tax determination deserves a seat at the table in ERP modernization governance—and what organizations stand to gain when they get it right. We hope it serves as a catalyst for conversations between technology leaders, finance executives, and tax professionals about how to transform a compliance burden into a competitive advantage.

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