Journal of Computer Science and Technology Studies
ISSN: 2709-104X
DOI: 10.32996/jcsts
Journal Homepage: www.al-kindipublisher.com/index.php/jcsts

JCSTS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Why SAP ECC Customers Must Migrate to SAP S/4HANA: An Architect's Perspective

Rahul Bhatia
Senior IEEE Member, Independent Researcher, United Kingdom
Corresponding Author: Rahul Bhatia, **E-mail**: rahul.bhatia20@ieee.org

| ABSTRACT
After working with enterprises across industries and geographies, I have observed that many organizations still rely on SAP ECC as their financial and operational backbone. While ECC has served businesses well, its limitations in agility, compliance, and intelligence are becoming increasingly evident. With SAP announcing the end of mainstream maintenance for ECC by 2027 (and extended maintenance until 2030 at a premium), customers face a choice: modernize with S/4HANA or fall behind in a rapidly changing digital economy. In this paper, I argue from practice and experience why the migration to SAP S/4HANA is not merely a technical upgrade but a strategic transformation—one that enables transparency, compliance, and predictive intelligence.

| KEYWORDS

SAP ECC Customers; SAP S/4HANA; Architect's Perspective

| ARTICLE INFORMATION

ACCEPTED: 01 August 2025 **PUBLISHED:** 02 September 2025 **DOI:** 10.32996/jcsts.2025.7.9.28

1. Introduction: The ECC Legacy and the Urgency of Change

SAP ECC has been the backbone of enterprise operations for decades, and in my own experience working with clients across industries, it has delivered stability, integration, and global scalability. For many organizations, ECC allowed the shift away from fragmented, siloed applications by offering end-to-end integration across finance, supply chain, and procurement. Over the years, I have seen ECC enable business continuity and reliable operations, making it a trusted ERP core.

However, the same architecture that once made ECC effective is now its biggest limitation. In projects I have led, common challenges with ECC include lengthy month-end closings, reconciliation across FI and CO, reliance on heavy custom code, and lack of real-time insights. These issues not only slow down operations but also prevent leadership teams from making agile, data-driven decisions. For example, in several finance transformation engagements, organizations were constrained by ECC's batch-driven processing, where critical insights often came days or weeks after they were needed.

Compliance has also become increasingly difficult under ECC. As new regulations around data protection, sustainability reporting, and tax digitization emerge, ECC environments often depend on manual workarounds or external bolt-ons to remain compliant. I have seen this first-hand with public sector and healthcare clients, where manual processes introduced inefficiencies and risk. These challenges confirm what the literature highlights: Vaka et al. (2024) emphasize that remaining on ECC introduces "hidden risks of compliance gaps, higher technical debt, and increased operational cost," while Kumar & Awasthi (2022) describe how S/4HANA provides an in-memory digital core designed for real-time analytics and simplified processes.

The urgency of change is underscored by SAP's roadmap. Mainstream maintenance for SAP ECC will end in 2027, with extended maintenance available only until 2030 at a premium cost (SAP, 2023). This means organizations that remain on ECC face not only higher support costs but also the risks of security vulnerabilities, compliance gaps, and losing access to new innovations. In my experience, late adopters also suffer from resource scarcity and higher implementation costs as demand for S/4HANA expertise grows.

From practice and research, the message is consistent: organizations must move from a legacy, transaction-oriented ERP like ECC to an intelligent, real-time, cloud-enabled platform that supports compliance-by-design, operational efficiency, and predictive insights. This makes migration to SAP S/4HANA not just an IT-driven choice but a strategic necessity for resilience and competitiveness.

2. Lessons from the Field: Why S/4HANA Is Different

One of the most important lessons I have learned as an architect is that SAP S/4HANA is not an upgrade of ECC—it is a fundamentally new platform. In conversations with clients, I often emphasize that this is not about "installing a new version" but about adopting a new digital core that changes how finance and operations run at their foundation.

The most significant difference I have seen in practice is the Universal Journal (ACDOCA), which brings together financial accounting (FI) and controlling (CO) into a single line item table. In ECC projects, I repeatedly encountered the challenges of reconciling data between FI and CO, which often led to manual work, delays, and inconsistencies. With S/4HANA, that reconciliation is eliminated because the architecture itself enforces a single source of truth. This not only simplifies processes but also speeds up month-end closing and improves auditability.

Another major difference is the in-memory HANA database, which allows real-time processing. In ECC, financial and operational reporting was batch-driven, which meant decision-makers relied on outdated information. In my S/4HANA programs, clients have been able to generate real-time profitability reports, cash flow projections, and supply chain analytics directly from transactional data—something that was impossible in ECC without additional data warehouses or custom solutions.

Embedded Analytics and Fiori UX are also game changers. In the projects I've led, business users moved away from static reports to interactive dashboards directly embedded in their transactional screens. This has transformed the way finance teams work—shifting them from retrospective reporting to proactive, insight-driven decision-making.

From an extensibility perspective, S/4HANA promotes a clean-core philosophy, where core processes are kept standard and enhancements are built using SAP Business Technology Platform (BTP). In ECC, I have seen organizations weighed down by years of custom code, which made upgrades costly and risky. With S/4HANA, extensions can be handled as side-by-side applications or in-app key-user enhancements, which drastically reduces technical debt and improves agility.

These practical observations are echoed in academic and practitioner literature. Vaka et al. (2024) describe S/4HANA as a "process re-engineering platform" that enables enterprises to modernize both technology and business models. Kumar & Awasthi (2022) explain how S/4HANA transforms ERP from being transaction-driven to analytics-driven, making it far better suited to digital economies. SAP itself emphasizes that the simplified data model, in-memory processing, and embedded intelligence are the core reasons why S/4HANA is not just an incremental upgrade but a new digital foundation (SAP, 2023).

In my experience, organizations that approach S/4HANA as a technical migration often miss the bigger picture, while those that treat it as a business transformation unlock far greater value—reducing closing cycles, embedding compliance, and creating room for innovation through AI and automation.

3. Cloud Readiness: Aligning IT with Business Strategy

S/4HANA supports **Public, Private, and Hybrid Cloud** models, offering flexibility that ECC simply cannot match.

- **Public Cloud** enforces fit-to-standard, quarterly innovations, and rapid deployment. In my experience, this is ideal for organizations looking for standardization and quick time-to-value, such as government or healthcare providers.
- **Private Cloud** offers greater flexibility, useful for industries with complex custom processes (e.g., manufacturing and automotive).
- **Hybrid models** allow a gradual transformation, integrating legacy processes while modernizing core functions.

Gartner (2024) recognizes S/4HANA Cloud Public Edition as a **Leader** in ERP for both product-centric and service-centric enterprises. This aligns with what I've seen in practice: public sector councils, manufacturers, and healthcare organizations choosing Public Cloud to modernize finance, while global corporates often pursue Private Cloud for control and customization.

4. Transparency, Compliance, and Fraud Prevention

Transparency and compliance are among the strongest business cases for S/4HANA. In ECC, organizations often rely on fragmented reporting and manual audit trails, which increase risk and cost. In contrast, S/4HANA delivers:

- **Real-time visibility** through Universal Journal and embedded analytics.
- **Regulatory compliance** through built-in IFRS, GAAP, and industry-specific reporting content.
- **Fraud prevention** via AI-driven anomaly detection and segregation-of-duties controls.

For example, in my work with a healthcare provider, migrating from ECC to S/4HANA allowed automated fund distribution tracking—ensuring compliance with both financial regulations and public accountability.

Literature reinforces this. Rashid & Tiwari (2023) highlight how S/4HANA improves compliance by embedding governance into the finance core. My own frameworks, **DFRA™ (Digital Finance Reference Architecture)** and **FAST™**, extend these principles by embedding fraud-prevention and compliance-by-design mechanisms into transformation programs.

5. AI and Predictive Insights: Beyond Automation

In my experience, ECC customers often view ERP as a **system of record**. With S/4HANA, ERP becomes a **system of prediction and decision-making**.

Key capabilities include:

- **Predictive forecasting** for cash flows, inventory, and demand.
- **Intelligent automation** in accounts payable and procurement.
- **AI-driven anomaly detection** for compliance and fraud monitoring.

In one project, implementing predictive MRP in S/4HANA significantly improved supply chain resilience by anticipating shortages before they occurred.

As Subramanian (2021) notes, "S/4HANA, coupled with AI, transforms ERP from a record-keeping system into a decision-support system." This transition aligns with what I have repeatedly witnessed in transformation programs.

Dimension	SAP ECC (Legacy)	SAP S/4HANA (Next-Gen)	Industry Impact
Data Model	Multiple ledgers and tables (FI, CO, ML, AA) requiring reconciliation	Universal Journal (ACDOCA) – single source of truth	Faster close, reduced reconciliations
Processing	Batch-driven, delayed insights	In-memory real-time processing	Real-time analytics and forecasting
User Experience	SAP GUI, siloed reporting	Fiori UX, role-based dashboards	Improved adoption and decision-making
Compliance	Manual workarounds, custom code	Embedded regulatory content, audit trails	Compliance by design
Extensibility	Heavy custom ABAP code, upgrade risk	Clean-core + SAP BTP extensibility	Future-proof innovation
Analytics	Separate BW/BI layer required	Embedded analytics in core	Integrated operational reporting
AI/Automation	Limited, external add-ons	Native AI/ML + automation scenarios	Predictive insights, fraud detection

Fig1: Key Differences Between SAP ECC and SAP S/4HANA

Source: Author's experience; SAP SE (2023); Kumar & Awasthi (2022); Vaka et al. (2024)

6. The Cost of Waiting

One of the recurring conversations I have with SAP ECC customers is around timing. Many organizations assume they can delay their migration until 2027 or even closer to 2030, thinking that postponing the move reduces risk. In my experience, the reality is quite the opposite—**the longer enterprises wait, the more risks and costs accumulate.**

First, there is the issue of **resource availability**. Having worked on multiple S/4HANA programs, I have already seen demand for skilled architects, consultants, and integration specialists growing rapidly. As the 2027 deadline approaches, this demand will only intensify. Late adopters will face not only higher consulting costs but also **capacity bottlenecks**, with the best resources already tied up in earlier programs. This aligns with the findings of Vaka et al. (2024), who note that organizations migrating late encounter "scarcity in both consulting expertise and system integration bandwidth."

Second, the **hidden costs of staying on ECC** continue to rise. I have observed finance teams spending weeks on reconciliations, compliance checks, and manual reporting because ECC lacks real-time processing and embedded analytics. These inefficiencies translate directly into financial overheads. In regulated sectors such as healthcare and public services, I've seen manual workarounds increase compliance risks and introduce opportunities for fraud. This mirrors Kumar & Awasthi (2022), who emphasize that legacy ERP systems accumulate technical debt and process inefficiencies the longer they remain in place.

Third, there is the **compliance challenge**. Regulations are evolving faster than ECC's ability to adapt. I have personally supported clients who struggled to align with new tax digitization requirements or ESG disclosures while running ECC, forcing them into costly custom developments or third-party bolt-ons. In contrast, S/4HANA delivers compliance-by-design capabilities, with frequent updates in its Public Cloud edition. Remaining on ECC increases the chance of non-compliance, reputational damage, and regulatory penalties. Rashid & Tiwari (2023) also confirm that organizations relying on ECC face growing compliance exposure compared to those adopting S/4HANA.

Finally, there is the **lost opportunity cost**. Every year that organizations delay migration is another year without real-time insights, predictive analytics, and automation capabilities that competitors may already be exploiting. In my advisory work, I have seen companies that migrated early use S/4HANA's predictive cash flow forecasting and AI-driven procurement to gain competitive advantage, while their peers on ECC continued to rely on reactive, outdated processes. Subramanian (2021) captures this shift by noting that S/4HANA, when combined with AI, "moves ERP from a record-keeping system into a decision-support system."

In short, the **cost of waiting is far greater than the cost of moving early**. By postponing migration, organizations risk:

- Paying premium consulting fees due to demand spikes.
- Falling behind on compliance and governance.
- Bearing the operational costs of inefficiency.
- Missing out on innovation opportunities that early adopters are already realizing.

From my experience, those who start early are able to structure their programs, adopt a phased approach, and secure the right talent, while those who delay often end up rushing under pressure, paying more, and realizing less value.

7. Migration Pathways: Choosing the Right Approach

When I advise organizations on their journey from ECC to S/4HANA, one of the most critical decisions is selecting the right **migration pathway**. The choice is not just a technical one—it is fundamentally tied to the business strategy, the organization's appetite for change, and the level of process standardization they want to achieve. Over the years, I have worked with clients who chose each of the three major approaches—**Greenfield, Brownfield, and Selective Data Transformation**—and the lessons from those projects confirm that there is no "one-size-fits-all" path.

Pathway	Description	When to Choose	Risks	Benefits
Greenfield	New implementation with best practices	Legacy systems with heavy customizations; desire for standardization	Business disruption, data migration challenges	Clean slate, process standardization, faster innovation
Brownfield	Technical system conversion	Stable ECC processes; need to preserve history	Carries forward inefficiencies	Lower disruption, faster transition
Selective Transformation	Hybrid approach: migrate selectively by region, process, or data	Complex global enterprises; phased adoption needed	Requires strong governance	Balance of continuity and innovation, phased value delivery

Fig 2: Migration Pathways for ECC Customers

Sources: Author's experience; Vaka et al. (2024); Rashid & Tiwari (2023)

7.1 Greenfield: Starting Fresh

The **Greenfield approach** involves implementing a brand-new S/4HANA system, reimagining processes, and discarding legacy complexity. In my experience, this path works best for organizations that:

- Want to adopt **SAP Best Practices** and fit-to-standard processes.
- Are struggling with years of **custom code, fragmented data, and technical debt**.
- See migration as a chance to **transform business models**, not just IT systems.

For example, a healthcare provider I advised selected Greenfield to standardize finance and procurement across multiple trusts. By doing so, they reduced reconciliation times and gained a single version of financial truth across the organization. Literature supports this: Vaka et al. (2024) describe Greenfield as the most effective strategy for organizations seeking process re-engineering and simplification, while Kumar & Awasthi (2022) emphasize that it accelerates innovation adoption by removing the weight of legacy customization.

7.2 Brownfield: Converting What Exists

The **Brownfield approach**—a system conversion—preserves existing ECC configuration and data while migrating to S/4HANA. I have seen this option chosen when:

- Organizations want to **minimize disruption** to ongoing operations.
- There is value in retaining **existing processes and historical data**.
- Timelines are tight, and the business prefers an **incremental change**.

For instance, a global manufacturing client I worked with pursued Brownfield to quickly transition finance processes to S/4HANA while maintaining existing supply chain operations. This allowed them to comply with SAP's roadmap without overhauling everything at once. Rashid & Tiwari (2023) note that Brownfield is often more cost-effective in the short term, particularly for enterprises with heavy industry-specific processes that cannot easily be standardized.

7.3 Selective Data Transformation: A Hybrid Approach

Increasingly, I have found that many organizations are gravitating towards **Selective Data Transformation** (SDT). This approach combines the flexibility of Greenfield with the continuity of Brownfield. Organizations can selectively move **certain business units, regions, or processes** to S/4HANA while leaving others behind, or they can migrate only **relevant data** instead of decades of history.

In practice, I worked with a multinational organization that used SDT to harmonize their European finance operations while leaving Asia-Pacific on ECC temporarily. This allowed them to deliver quick wins in one region without overloading the entire enterprise with a single, global transformation. Academic literature also highlights SDT's growing relevance. Vaka et al. (2024)

identify it as a "balanced pathway" that helps reduce program risk, while Subramanian (2021) underscores its role in enabling stepwise adoption of predictive and AI-driven processes.

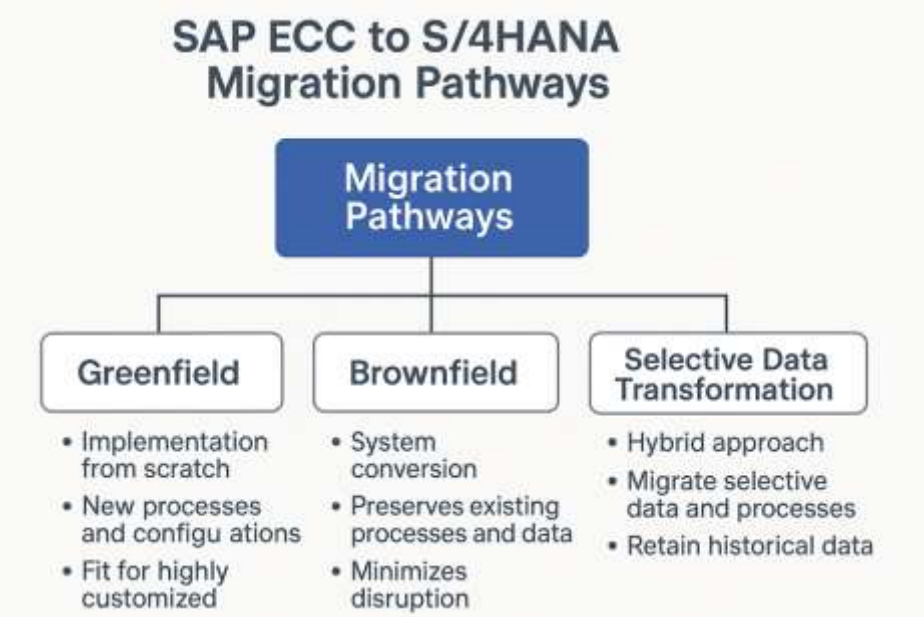

Fig 1: SAP ECC to S/4 HANA Migration Pathways

7.4 Choosing the Right Path

From my perspective, the decision on migration pathway should be based on **business value, not technical convenience**. Too often, organizations start with an IT-led decision, but successful transformations are those where the pathway aligns with:

- The **strategic priorities** of the organization (e.g., standardization vs. continuity).
- The **readiness of data and processes** (clean vs. heavily customized environments).
- The **risk appetite** and cultural willingness to embrace change.

In my experience, clients who made this decision strategically were able to treat the migration as a **business transformation journey** rather than just an IT project. By doing so, they delivered not just compliance with SAP's deadlines but also measurable business outcomes: faster closes, automated reporting, and predictive insights.

8. Recommendation for ECC Customers

Based on my global experience leading SAP finance and digital transformation programs, my clear recommendation to organizations still operating on ECC is this: **treat the migration to SAP S/4HANA not as an IT upgrade, but as a strategic business transformation.**

The temptation for many enterprises is to delay the move, take a minimal compliance-driven approach, or view the migration as a purely technical exercise. In my professional experience, these are the projects that deliver the least value and face the greatest risks. By contrast, organizations that use the migration as an opportunity to **reimagine processes, adopt a clean-core philosophy, and embed intelligence into finance and operations** consistently achieve faster closings, stronger compliance, and future-ready capabilities.

As an architect, I advise ECC customers to focus on three imperatives:

1. **Act Early:** The longer you wait, the higher the costs, risks, and resource constraints. Early movers secure the best talent, shape their programs at a sustainable pace, and capture value sooner.

2. **Think Business, Not Just IT:** Define your transformation goals in terms of measurable business outcomes—real-time transparency, compliance-by-design, fraud prevention, and predictive insights. Let technology be the enabler, not the driver.

3. **Adopt a Clean Core with Extensibility:** Avoid replicating legacy customizations in S/4HANA. Standardize wherever possible, and leverage SAP BTP for innovation and extensions. This ensures agility, reduces technical debt, and future-proofs your ERP landscape.

From my perspective, organizations that treat migration as a **finance and business transformation journey**—rather than a technical necessity—unlock far greater value. They move from reactive, compliance-driven operations to proactive, insight-driven enterprises.

In conclusion, my recommendation to ECC customers is clear: **begin the migration to S/4HANA now, design it as a business transformation, and use it to build an intelligent, compliant, and resilient digital core.** This is not just about keeping up with SAP's roadmap—it is about positioning your organization to thrive in the digital economy.

9. Conclusion

Based on my global project experience, I believe the migration from ECC to SAP S/4HANA is both a **technical necessity** and a **strategic opportunity**. Organizations that act early will unlock real-time transparency, embedded compliance, and predictive intelligence, positioning themselves for resilience and growth in the digital economy.

Those that delay risk not only higher costs and talent shortages but also compliance gaps and missed opportunities for innovation. As both practice and academic literature confirm, the migration should not be viewed as an upgrade—it is a **finance and business transformation journey**.

References

[1] SAP SE. (2023). *Maintenance Strategy for SAP Business Suite 7 and S/4HANA*. SAP Support Portal.
[2] SAP SE. (2023). *SAP S/4HANA Overview: Next-Generation Business Suite*. SAP White Paper.
[3] Vaka, D. K., Sharma, A., & Patel, R. (2024). The SAP S/4HANA Migration Roadmap: From Planning to Execution. *Journal of Software and Applied Enterprise Research (JSAER)*.
[4] Kumar, R., & Awasthi, A. (2022). *SAP S/4HANA Business Process Integration*. Springer.
[5] Subramanian, G. H. (2021). Artificial Intelligence and ERP: Toward Predictive Enterprises. *International Journal of Information Systems and Management Science, 34*(2).
[6] Rashid, H., & Tiwari, R. (2023). Enhancing Transparency and Compliance in Public Sector Finance through SAP S/4HANA. *Journal of Government Information Systems, 15*(4).
[7] Gartner. (2024). *Magic Quadrant for Cloud ERP for Product-Centric Enterprises*. Gartner Research.