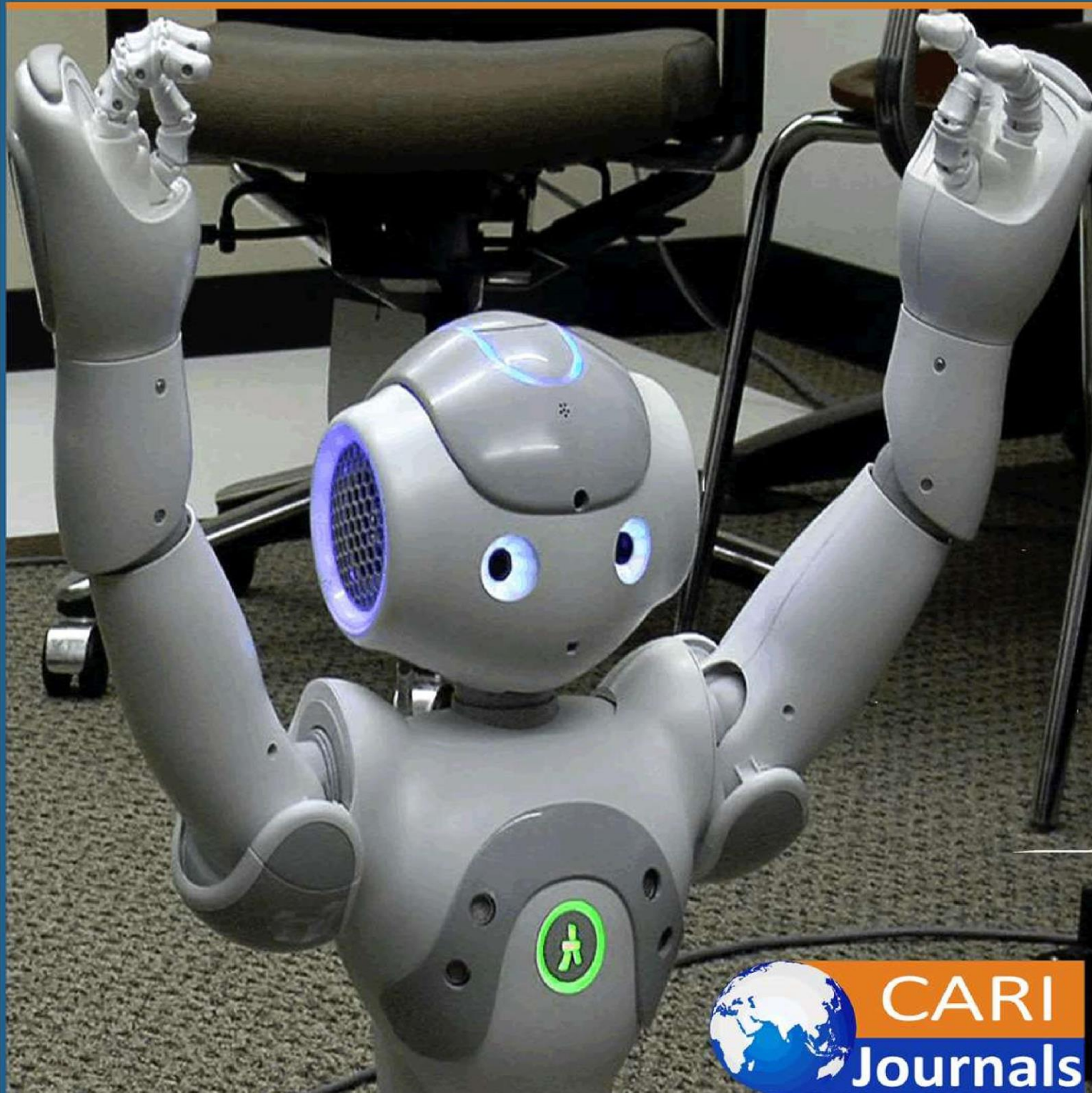
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A Practical Decision Framework for Migrating from SAP ECC to SAP S/4HANA: Migration paths, Data Readiness, Risks, and Cutover controls

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Abstract

Purpose: This paper develops a practical decision framework for organizations planning a transition from SAP ERP Central Component (ECC) to SAP S/4HANA. It addresses three questions: (1) how should organizations distinguish system conversion, new implementation, and selective data transition, (2) which data, technical, and organizational readiness conditions most affect pathway selection and cutover risk, and (3) which SAP tools apply to each transition scenario?

Methodology: The paper uses a narrative review of SAP primary documentation and selected practitioner publications, complemented by peer-reviewed ERP implementation research and one publicly documented secondary case. Sources were selected for direct relevance to ECC-to-S/4HANA transition choices, SAP tool capabilities, maintenance policy, and ERP success factors, claims from vendor case material are treated as reported claims rather than independently verified outcomes.

Findings: The reviewed evidence indicates that system conversion is a distinct technical route supported by Maintenance Planner, Simplification Item checks, custom-code analysis, and Software Update Manager (SUM), with DMO used when database migration is also required. The Migration Cockpit is a data-migration facility for supported migration objects and scenarios, not a replacement for SUM/DMO in a system conversion. Its documented methods include staging tables and direct transfer from supported SAP source systems, file/template upload is a way to populate staging tables, not a third equivalent migration approach. Selective data transition is constrained by target edition and SAP-supported engagement conditions.

Unique Contribution to Theory, Policy and Practice: The paper synthesizes these distinctions into a pathway-selection framework and a readiness checklist linking business objectives, data scope, deployment edition, technical prerequisites, and cutover evidence. It is intended as a decision aid for SAP ECC organizations, not as a report of original empirical fieldwork.

Keywords: *SAP ECC, SAP S/4HANA, System Conversion, New Implementation, Selective Data Transition, Migration Cockpit, SUM/DMO, Data Migration, ERP Transformation.*

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I. Introduction

Enterprise resource planning (ERP) systems support finance, procurement, sales, manufacturing, supply chain, and other core business activities. Many organizations have used SAP ECC for years and have built business processes, interfaces, reports, and custom programs around it. Moving to SAP S/4HANA is therefore more than installing a new software version. It is a coordinated change to the application landscape, data model, business processes, and operating model.

The migration decision is influenced by SAP's product roadmap and maintenance policy. The commonly cited 2027 date is not a universal end date for every ECC installation. SAP documentation states that maintenance for SAP ERP 6.0 up to EHP5 is available through December 31, 2025, for EHP6–EHP8, mainstream maintenance ends December 31, 2027, while extended maintenance is available through December 31, 2030 [16]. Organizations must verify their exact product release, enhancement package, support package, and contractual eligibility rather than apply a single date to every ECC landscape.

A successful program starts with a clear business case. Common drivers include a modern ERP foundation, simplified processes, improved reporting, better user experience, and access to continuing SAP innovation. At the same time, the project can expose old data-quality problems, custom-code dependencies, and integration weaknesses. This paper organizes the migration pathway into five areas: migration approach, migration process, Migration Cockpit, risks and opportunities, and a practical case example.

The practical problem is that migration guidance often groups together business transition patterns and technical data-loading tools. This can lead to an incorrect assumption that the Migration Cockpit is the primary mechanism for every ECC-to-S/4HANA project, or that all pathways are available for every target edition. At the same time, data readiness and production downtime are frequently discussed without a common set of decision criteria. Existing vendor guidance is useful for product-specific steps, while ERP research explains organizational success factors, neither alone provides a concise framework connecting pathway choice, tool fit, data readiness, and cutover evidence.

Accordingly, this paper addresses three research questions: RQ1: What criteria distinguish a new implementation, system conversion, and selective data transition? RQ2: How do SAP-supported tools and target-edition constraints affect the feasible migration pathway? RQ3: What evidence should project leaders require before approving production cutover?

The paper contributes a practical synthesis rather than a new causal theory or primary empirical dataset. Its intended readers are enterprise decisionmakers, SAP program managers, solution architects, data leads, and functional owners in organizations operating SAP ECC and evaluating an SAP S/4HANA target. The framework is applicable across industries, but technical feasibility must be checked against the specific source release and target edition.

II. Literature and Migration Pathway

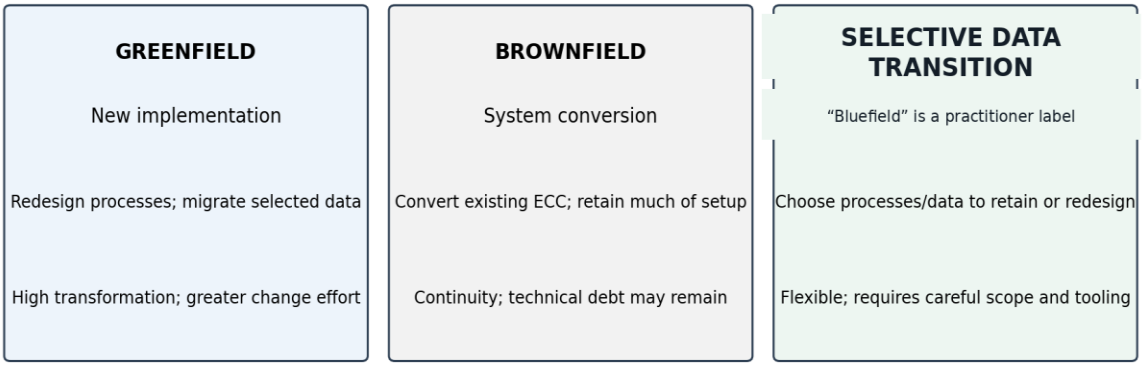
A. Review Method and Conceptual Lens: This article is a narrative review, not a systematic review or primary field study. The source set was assembled purposively: SAP Help Portal and SAP Support documentation were prioritized for product capabilities, maintenance policy, conversion prerequisites, and deployment constraints, peer-reviewed ERP studies were selected for implementation success factors, change management, and lifecycle outcomes, and practitioner sources were retained only where they supplied a clearly identified implementation example or operational explanation. Sources were screened for direct relevance to ECC-to-S/4HANA transition decisions and for identifiable authorship, publication venue, or official SAP ownership. No interviews, surveys, internal company records, or original project measurements were collected. The Eurasia Group example is therefore analyzed as a secondary, vendor-published case, not as the author's firsthand project experience.

The conceptual lens is socio-technical ERP implementation. Nah and Delgado identify business vision, change management, communication, team capability, management support, project management, and technical implementation as critical success-factor categories [17]. Markus et al. show that ERP success varies across the system life cycle and that problems appearing late may originate in earlier phases [18]. These findings support treating migration readiness as a combination of technical fit, data integrity, governance, user adoption, and post-go-live stabilization rather than as a one-time technical conversion.

The research gap addressed here is practical and integrative: product documentation explains individual tools and prerequisites, while ERP literature explains organizational success factors, but project teams still need a concise way to connect pathway selection to data scope, tool choice, edition constraints, and evidence-based go/no-go criteria. The framework below responds to that gap. It does not claim that the three research questions are tested statistically.

B. Transition Pathways: New Implementation, System Conversion, and Selective Data Transition: The choice determines how much of the existing ECC configuration, process design, and data is retained. "Greenfield" and "Brownfield" are common practitioner labels, SAP documentation more precisely describes implementation and system conversion. "Bluefield" is a market term sometimes used for selective data transition, this paper uses SAP's term, selective data transition (SDT), in the technical discussion [5], [16], [19].

Fig. 1. Comparison of new implementation, system conversion, and selective data transition (Bluefield is a practitioner label, original illustration revised).



1) Greenfield (new implementation): The organization builds a new SAP S/4HANA environment and configures business processes using the target solution's standard capabilities. Only the data required for the new scope is migrated. This option is suitable when existing processes are highly customized, the organization wants substantial process redesign, or legacy complexity should not be carried forward. It creates an opportunity to standardize operations, but requires more business involvement, data mapping, change management, and user training [6], [8], [13].

2) Brownfield (system conversion): The existing ECC system is converted to SAP S/4HANA, retaining much of its configuration, historical data, and business process design, subject to mandatory technical and functional changes. It can reduce disruption and preserve existing investments when the current landscape is reasonably healthy. However, it does not automatically remove inefficient processes or technical debt. Custom code, add-ons, interfaces, and data structures must be checked for compatibility [1], [5], [7], [9].

3) **Selective data transition (often called "Bluefield" by practitioners):** This approach selectively transfers organizational structures, configuration, and chosen data while allowing targeted process redesign. It can suit carve-outs, mergers, phased transformations, or enterprises that need a controlled combination of reuse and redesign. It is not a universal self-service option: SAP states that its Selective Data Transition engagement supports SAP S/4HANA On-Premise and specified Private Cloud Edition arrangements, while transition into SAP S/4HANA Public Cloud is not supported under that engagement [19]. The feasible scope, tooling, and delivery model must therefore be confirmed with SAP and the chosen implementation partner.

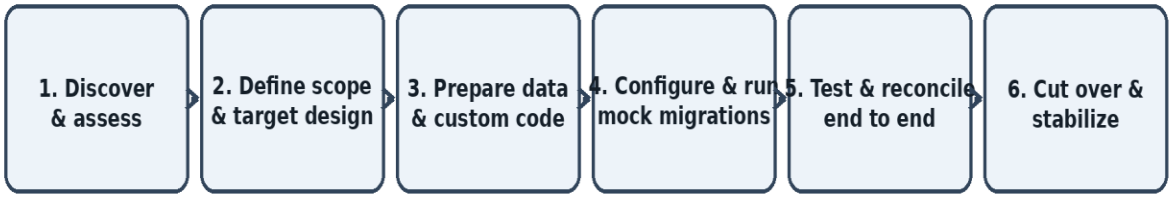
No pathway is automatically best. A stable ECC environment with a need to retain established processes may support system conversion, a business seeking broad process redesign may favor a new implementation, and a complex enterprise needing selective reuse may assess SDT. The decision must be tested against source release, add-on compatibility, data-retention rules, target edition, and the organization's appetite for process change [16], [19], [20].

TABLE I. SUMMARY OF COMMON SAP S/4HANA MIGRATION APPROACHES

Decision factor	Greenfield	Brownfield	Bluefield
Process change	High, redesign from a clean start	Limited to targeted changes	Selective redesign
Existing configuration	Rebuild in target system	Mostly retained after adaptation	Selected configuration reused
Data scope	Selected data migrated	Broad system data conversion	Selected data and history
Typical strength	Simplification and standardization	Continuity and reuse	Balance of reuse and change
Main challenge	Change effort and data mapping	Legacy complexity and compatibility	Scope, tooling, and reconciliation

C. Migration Process: A migration program should be managed in controlled stages. The exact activities vary by approach and target edition, but the following sequence provides a practical framework consistent with the preparation and implementation guidance discussed in [1], [2], [8], [9], [10], [12], and [13].

Fig. 2. Simplified ECC-to-S/4HANA migration pathway (original illustration).



1) Discover and assess: Inventory ECC systems, databases, operating systems, add-ons, interfaces, custom code, data volumes, business processes, and reporting. Confirm the current SAP release, target S/4HANA version, deployment option, and support position. Run relevant readiness and simplification analyses, and identify mandatory changes before committing to a schedule [1], [7], [9], [12].

For a system conversion, the technical workstream is distinct from a Migration Cockpit data load. SAP's documented sequence includes Maintenance Planner checks, the Simplification Item Check, custom-code analysis and remediation, SUM prerequisite checks, and execution of SUM. Where the source database is not SAP HANA and a database move is required, SUM is used with the Database Migration Option (DMO), where the source is already on SAP HANA, SUM may be

used without DMO [20], [21]. These checks should be planned as early work, not deferred until the production cutover phase.

2) Define scope and target design: Agree business outcomes, migration approach, company-code and plant scope, data-retention rules, integration architecture, security roles, and reporting needs. Decide which processes will be retained, redesigned, or retired. Assign business owners for each data object and process area. The assessment-led approach described by Sutherland similarly emphasizes understanding the landscape before selecting a transformation path [12].

3) Prepare data and custom code: Profile master and transactional data, remove duplicates, correct invalid values, and agree mapping rules. Classify historical data as active,

frequently used, or archival where business and legal rules allow. Analyze custom ABAP code and remediate incompatible or unused objects. Automation can assist with large code inventories, but functional owners must validate that the changed programs still meet business requirements [1], [4], [10].

4) Configure and migrate in non-production: Build the target environment, configure organizational structures, adapt interfaces, and load representative data. Execute one or more mock migrations. Record load duration, errors, reconciliation results, and manual steps. Repeat the cycle until the team can meet the agreed quality and timing targets [2], [4], [8].

5) Test end to end: Testing should cover unit, integration, regression, user acceptance, security, authorization, output forms, analytics, and performance. Business scenarios should cross module boundaries—for example, order-to-cash, procure-to-pay, record-to-report, and plan-to-produce. Reconcile opening balances, inventory, open items, and key master-data counts before approval. Testing and change-impact analysis reduce the risk of defects appearing after go-live [8].

6) Cut over and stabilize: Prepare a detailed cutover plan with task owners, dependencies, start and finish criteria, rollback decisions, communication steps, and business signoffs. Freeze or control source-system changes, perform final extraction and load, reconcile data, release user access, and monitor critical transactions. After go-live, provide focused support, resolve defects, and measure whether the expected business outcomes are being achieved [9], [12].

Change management is another key workstream. Employees may need to learn updated screens, revised approvals, new reporting methods, and changed responsibilities. Training should be role-based and use realistic business scenarios rather than only generic system navigation. Super users can support local teams, collect feedback, and help identify process issues during testing. Communications should explain why the organization is migrating, what will change, when users will be affected, and where support will be available. This is particularly important for organizations using a Greenfield or Bluefield approach because process change may be greater than in a technical conversion [6], [8], [13].

Data governance should be treated as a continuing activity, not a one-time cleansing task. Organizations should define data owners, quality rules, retention periods, duplicate-handling rules, and approval processes for each important object. For example, material master data may need checks for units of measure, product hierarchy, plant views, and purchasing attributes. Business partner data may need address, tax, bank, and relationship checks. Finance data requires agreement on balances, open items, currencies, and reconciliation totals. These controls reduce the chance that technically valid records create operational errors after go-live [1], [4], [7].

An assessment should produce a fact-based baseline rather than a general statement that the system is "ready." Useful outputs include a system inventory, add-on compatibility list, custom-code usage report, interface catalogue, data-volume profile, business-process map, target architecture, and high-level cost and schedule estimate. The team should also identify simplification items that affect current business processes. For example, a change to customer and vendor master-data handling may require business partner conversion activities and changes to data ownership. Such items should be assigned to functional owners early rather than left until final testing [1], [7], [9], [12].

Program governance and workstream design are important because migration activities are interdependent. A typical program includes business process, application and technical architecture, data, integration, security, testing, change management, and cutover workstreams. Each workstream should have a named owner, deliverables, decision dates, and dependencies. A steering group should resolve cross-functional issues such as whether historical transactions must be migrated, which interfaces can be retired, and how much process change is acceptable. This governance model prevents technical teams from making decisions that have an unplanned effect on finance, operations, or compliance.

A practical cutover plan should be developed early and refined after each mock migration. It normally includes business and technical freeze dates, final backup, confirmation of source-system status, extraction start and finish, data-load sequence, reconciliation checkpoints, interface activation, job scheduling, user access, and business validation. The plan should state who can authorize each step and who makes the go/no-go decision. A clear rollback or contingency plan is also needed, including the point after which returning to ECC is no longer practical because new transactions have been entered in the target system. The cutover should be rehearsed with realistic data volumes and timed against the actual business calendar.

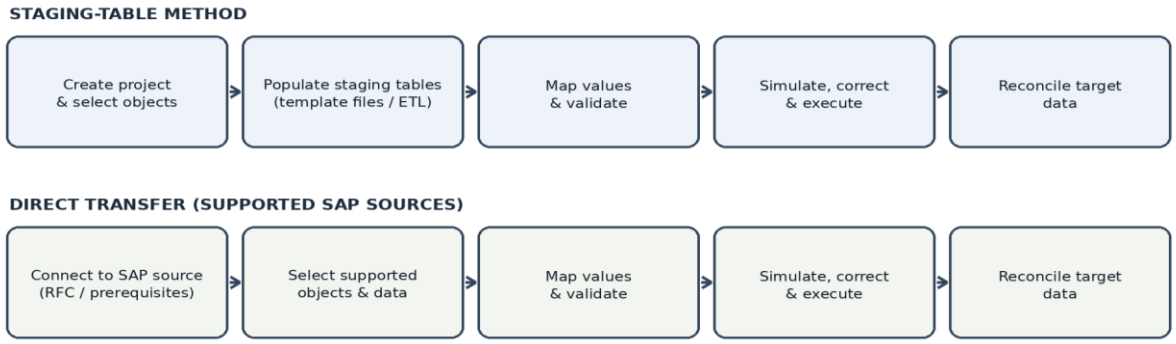
A migration program should define measurable readiness criteria. Examples include the percentage of critical custom code assessed, the number of high-priority defects still open, completion of critical interface tests, successful reconciliation of financial balances, completion of role-based training, and the ability to finish the mock cutover within the approved window. These indicators provide a more useful view of readiness than a single overall project-completion percentage. They also help leaders distinguish between work that is technically complete and work that has been accepted by the business.

D. SAP S/4HANA Migration Cockpit: Supported Data-Migration Methods: The SAP S/4HANA Migration Cockpit transfers business data through predefined migration objects and guided project activities. It is relevant to new implementations and supported data-transition scenarios, but it should not be confused with the SUM-based technical process used for a conventional ECC system conversion. The availability of migration objects and methods depends on the target release, deployment edition, and migration scenario, the project team must verify the current SAP Help documentation for its target [22], [23].

1) Staging-table approach: For supported migration objects, the cockpit creates staging tables in the selected database schema. Data can be populated using SAP-provided template files or suitable tools such as SAP Data Services. The cockpit validates the uploaded template data and transfers it into the staging tables, the migration project then supports mapping, simulation, error correction, execution, and monitoring. XML template upload is therefore a file-population mechanism within the staging-table approach, not a separate migration approach of equal status [22], [24].

2) Direct transfer from a supported SAP source system: For supported scenarios, the cockpit connects to an SAP source system, selects data for chosen migration objects using defined criteria, and transfers it to the S/4HANA target through an RFC connection. SAP documentation identifies supported source scenarios and prerequisites, including the relevant source components, connectivity, authorizations, and compatibility checks. Direct transfer is not a generic mechanism for arbitrary non-SAP or third-party sources [23], [25].

Fig. 3. Migration Cockpit data-migration methods and validation cycle (staging-table path and supported SAP-source direct-transfer path, original illustration should distinguish the two methods).



For a staging-table project, the operational cycle is - create a migration project, select the staging-table method, choose migration objects, download and populate templates or load data through an approved ETL tool, validate and map values, simulate, correct errors, execute, and reconcile results. For direct transfer, the project connects to a supported SAP source through the required RFC setup, selects eligible data, maps values, simulates, executes, and validates. The method must be chosen based on source-system support and target-release documentation, not convenience alone [22]– [25].

TABLE II. MIGRATION COCKPIT METHOD COMPARISON

Feature	Staging tables	Direct transfer
Data source	Files, ETL, or staging-table population	Supported SAP source system
Intermediate layer	Staging tables in the defined database area	Source connection and cockpit selection
Best fit	Multiple sources or prepared/transformed datasets	Supported SAP-to-SAP migration scenarios
Key controls	Template structure, mapping, staging validation	Connectivity, authorizations, selection criteria
Common caution	Correct template/object structure and data quality	Source-release and scenario compatibility

The cockpit does not replace data ownership or reconciliation. A successful load only confirms that records were processed by the migration object, it does not prove that the business meaning is correct. Finance, procurement, sales, and supply-chain owners must validate totals, open transactions, organizational assignments, and sample records. For complex transformations or objects not covered by standard content, the team may need extension tools, ETL, or a controlled custom migration design [2], [4], [14], [15].

The staging-table method provides an intermediate data layer for supported objects. Template files are uploaded into the generated staging tables after validation, or the tables may be populated with supported data tools. Direct transfer instead reads selected data from a supported SAP source system through an RFC connection. These methods are not interchangeable, and the file-upload step belongs to the staging-table route. Neither method substitutes for SUM/DMO when the project is a conventional system conversion [20], [22]– [25].

Mapping tasks translates source values into the values expected by the target system. Typical examples include mapping legacy company codes, plants, sales organizations, payment terms, units of measure, and account assignments. Mapping decisions should be approved by business owners and documented centrally. The same mapping must be applied consistently across related objects, otherwise, a customer, material, or financial record may load successfully but be assigned to the wrong organizational structure. Simulation results should be reviewed by both technical and functional teams, with clear responsibility for correcting source-data errors versus target-configuration errors [2], [4], [15].

Migration object selection is a design decision. A migration object represents a business entity or dataset and defines the structures and rules used to load it. The project team should review object documentation, required fields, dependencies, supported source structures, and post-processing

steps before selecting the object. The object list is release-dependent, so an object available in one S/4HANA edition or release may not be available in another. If a required object is not delivered, the team should evaluate supported extension mechanisms and avoid if a custom upload can safely bypass standard validations [2], [4], [14].

E. Migrating to S/4HANA - Risks and Opportunities:

Opportunities: S/4HANA migration can provide a modern ERP foundation, more timely operational information, simplified data structures, improved user experience, and a platform for analytics and process automation. It also creates a chance to retire unused customizations, standardize processes, improve master-data governance, and reconsider infrastructure and integration choices. The business value is strongest when the organization defines measurable outcomes rather than treating the project only as software conversion [3], [7], [9], [12], [13].

Support and roadmap risk: Remaining on ECC after the applicable mainstream-maintenance period can increase the effort required to maintain security, compliance, and technical compatibility. However, the exact support date depends on the installed product release and SAP maintenance terms. Organizations should validate the details for their own system, a 2027 date should not be applied indiscriminately to every ECC landscape [3], [9], [7], [13].

1. Data risk: Duplicate, incomplete, or inconsistent data can lead to failed loads and incorrect business results. Mitigation includes early profiling, ownership at business-object level, cleansing rules, mock loads, exception reporting, and reconciliation. Data selection should be deliberate - migrating everything may increase cost and complexity, while removing required history may affect audit, reporting, or operations [1], [4], [7].

2. Custom-code and integration risk: ECC environments often contain custom ABAP programs, user exits, interfaces, forms, and third-party add-ons. Some may require remediation or replacement. An inventory, usage analysis, compatibility assessment, and prioritized remediation plan help control the effort. Automated code analysis can accelerate the work, but functional testing remains necessary [7], [10], [12].

3. Business-continuity and people risk: Cutover may affect order processing, production, shipping, payments, or month-end closing. A realistic plan needs rehearsals, downtime estimates, rollback criteria, and business approval. Users also need role-based training and support because screens, workflows, and responsibilities may change. Inadequate communication can reduce adoption even when the technical migration succeeds [8], [9], [12].

4. Cost and schedule risk: Delayed decisions, underestimated data volumes, late discovery of add-on constraints, and insufficient testing can extend delivery. The project should track scope, risks, assumptions, dependencies, and resource capacity. A staged approach and early assessment can reduce surprises, while a cost model should include infrastructure, licenses, partners, internal staff, testing, training, and post-go-live support [9], [10], [12], [13].

Risk management should use a living register with probability, impact, owner, mitigation, and trigger conditions. High-priority risks may include an unsupported add-on, a critical interface with no replacement, poor master-data quality, an untested business-critical report, or a cutover dependency on a third party. Mitigation actions should have evidence: for example, a completed interface test, signed reconciliation, or successful mock cutover. A risk should not be marked closed simply because a plan exists, closure should require proof that the control works [8], [9], [12].

Deployment edition and transition pathway must be evaluated together. The labels new implementation, system conversion, and selective data transition describe different ways to establish the target system and move data, but the target edition constrains which routes are supported. SAP's Selective Data Transition engagement, for example, supports specified On-Premise and Private Cloud Edition scenarios but not transition into Public Cloud [19]. A project should therefore confirm the intended edition before approving the pathway. Compare infrastructure and service scope, extensibility, integration, data residency, security responsibilities, availability targets, upgrade responsibilities, and lifecycle cost alongside the technical migration route.

An opportunity that is sometimes missed is the chance to reduce the size and complexity of the application landscape. During assessment, organizations can identify reports that are no longer used, interfaces that duplicate information, custom programs that have been replaced by standard capabilities, and data that can be archived under approved retention rules. Removing unnecessary components can simplify testing and future maintenance. However, retirement decisions should be based on usage evidence and business-owner approval, an apparently unused report may still support an annual audit or regulatory process [1], [7], [9], [10].

The case also illustrates why public success stories should be interpreted cautiously. The reported cost and data-consistency improvements are vendor-published claims, the public summary does not provide enough detail to independently reproduce the baseline, measurement method, or attribution. The figures are therefore descriptive case evidence, not generalizable effect estimates. The project duration must also be distinguished from production downtime: an 8.5-month program does not imply that the production system was unavailable for 8.5 months.

III. Use Case / Case Study

ECC Conversion at Eurasia Group Kazakhstan

A public LeverX case study describes an ECC-to-S/4HANA conversion for Eurasia Group, an official John Deere dealer operating in Kazakhstan and Kyrgyzstan. The organization had an ECC environment that had not received substantial updates since 2014. The project included finance and controlling, procurement and materials management, sales and distribution, customer service, Basis, and ABAP development. The published account reports an 8.5-month project period from April to December 2022 and a team involving 13 LeverX experts and 25 customer specialists [5].

The reported outcomes were a 10% reduction in system maintenance costs and a 15% improvement in data consistency. The case also notes reviewing outdated processes and existing custom code, together with regular full and incremental backups. These are vendor-reported results and should not be treated as independently audited performance measures. The published material does not disclose the production cutover window or project budget [5].

This example provides two practical lessons. First, migration duration and downtime are different measures: an 8.5-month project does not mean that the production system was unavailable for 8.5 months. Second, conversion work should include process and code review, data-quality improvement, and operational controls rather than focusing only on the technical database move. Another example of LeverX describes a manufacturer that completed production cutover within a three-day holiday window but does not publish the total project duration [5].

These cases are useful as illustrations, not as universal benchmarks. A company should compare its own system size, data volume, integrations, geographic scope, business calendar, and testing needs before estimating timeline or downtime. The same caution is emphasized in case-study comparisons: project scope and reported duration must be read together [5].

Recommendations: A further practical recommendation is to maintain a decision log throughout the program. Decisions about historical data, process standardization, custom-code replacement, target deployment, and interface retirement often affect multiple teams. Recording the decision, options considered, business owner, rationale, and date reduces repeated debate and supports later audit or operational review. The log should be linked to scope, design, test evidence, and change control so that the final solution remains traceable to the original business requirements.

IV. Discussion

The evidence reviewed answers RQ1 by showing that the three pathways differ in the amount of process redesign, configuration reuse, and data selection, and should not be treated as interchangeable project labels. RQ2 is answered by the separation between conversion tooling and data-migration tooling: SUM (with DMO when required) is central to a conventional system conversion, while Migration Cockpit supports defined data-migration objects through staging tables or supported SAP-source direct transfer. Edition constraints are decisive, particularly for selective data transition. RQ3 is answered through the readiness checklist below: cutover approval should depend on demonstrated technical, data, integration, business, and people readiness, not on a percentage-complete status alone.

The case evidence is consistent with the broader ERP literature in one important respect: implementation outcomes depend on management, project organization, communication, technical fit, and sustained user participation as well as software execution [17], [18]. However, the case does not establish that the reported 10% maintenance-cost reduction or 15% data-consistency improvement would recur in other organizations. These outcomes should be treated as context-

specific vendor claims. The practical implication is to establish baselines before migration and measure outcomes after stabilization using consistent definitions.

The framework's principal contribution is a decision sequence: (1) confirm the target edition and source-system eligibility, (2) select the transition pathway based on process and data objectives, (3) select tools appropriate to that pathway, (4) establish object-level data ownership and reconciliation, and (5) require evidence-based cutover approval. This synthesis connects SAP's product-specific constraints with socio-technical ERP success factors. Its theoretical contribution is limited to applying an established socio-technical lens, it does not propose or validate a new theory.

V. Practical Readiness Checklist

Before approving a migration plan, project sponsors and workstream owners should verify the following items:

- Pathway and edition: target edition confirmed, source release and add-on compatibility checked, conversion, new implementation, or selective data transition selected with documented rationale.
- Conversion readiness (where applicable): Maintenance Planner checks completed, relevant Simplification Items reviewed, custom code assessed and remediated, SUM prerequisites passed, DMO decision documented where database migration is required.
- Data readiness: data owners assigned, profiling and cleansing rules approved, retention and archival decisions documented, mapping approved, object dependencies and load sequence validated.
- Migration method fit: Migration Cockpit objects confirmed for the exact target release, staging-table template/ETL process or supported direct-transfer connection tested, file upload not misrepresented as a separate method.
- Reconciliation: opening balances, open items, inventory, key master-data counts, and selected transactional samples reconciled and signed off by business owners.
- Integration and testing: critical interfaces, jobs, forms, authorizations, analytics, end-to-end scenarios, regression, performance, and security tests passed with defects triaged.
- Cutover and continuity: production cutover rehearsed with representative volumes, downtime window measured, dependencies, decision owners, contingency/rollback triggers, and go/no-go authority documented.
- People and operations: role-based training completed, support model, super-user network, communications, monitoring, and hypercare exit criteria approved.
- Benefits measurement: baseline measures defined for process time, data quality, cost, availability, and user adoption, post-go-live measurement owner and timing assigned.

VI. Limitations

This paper is a narrative review with purposively selected sources, not a systematic review. It does not include primary interviews, surveys, internal SAP project data, or direct observation of the cited case. The case study is a vendor-published secondary account and its reported outcomes are not independently audited in the source material. SAP tool capabilities and supported scenarios change by release and deployment edition, readers must consult the documentation applicable to their own landscape. The framework is a practical synthesis and has not been empirically validated across a sample of migration programs. Future research could test the checklist using multiple independent project cases and comparable measures of data quality, cutover duration, defect rates, and benefit realization.

VII. Conclusion

An ECC-to-S/4HANA transition is a business and technology program whose feasible pathway depends on the source landscape, target edition, process objectives, data-retention requirements, and organizational readiness. New implementation, system conversion, and selective data transition should be distinguished explicitly. A conventional system conversion relies on preparation and conversion activities such as Maintenance Planner, Simplification Item checks, custom-code analysis, and SUM, with DMO where a database migration is required. The Migration Cockpit supports defined data-migration scenarios through staging tables or direct transfer from supported SAP source systems. XML template upload is a way to populate staging tables, not a separate equivalent migration method.

The reviewed evidence supports several concrete conclusions. First, target edition and source compatibility must be confirmed before selecting the transition route. Second, data quality and reconciliation require named business ownership, successful technical loading alone does not establish business correctness. Third, mock conversions and migration rehearsals should produce measurable evidence on duration, errors, reconciliation, and cutover feasibility. Fourth, organizational factors—including leadership, communication, team capability, training, and post-go-live support—are central to ERP outcomes [17], [18]. Finally, public case-study percentages should not be generalized without comparable baselines and measurement methods.

The paper's contribution is a practical decision framework and readiness checklist that connect pathway choice, SAP tool fit, data governance, edition constraints, and cutover approval. The framework is intended to support planning and discussion, it is not a substitute for release-specific SAP guidance or a validated predictive model. Future multi-case research can assess its usefulness and test which readiness indicators most strongly predict migration quality and business outcomes.

VIII. Declarations

A. Conflict of Interest. Employee in a Company which uses SAP as one of its core enterprise resource planning (ERP) software and has no financial relationship with SAP or SAP implementation vendors. The manuscript was prepared as an independent scholarly activity arising

from the author's professional skills and personal interest in publishing. The author declares that the employment relationship has not influenced the analysis or conclusions presented in this paper.

B. Funding. No external funding was received for the research, authorship, or publication of this article.

C. Data Availability. No new datasets were generated or analyzed. This article is based on publicly available SAP documentation, published literature, and a publicly available secondary case study.

D. Declaration on the Use of Artificial Intelligence. ChatGPT (OpenAI) was used only to assist with editing and improving the manuscript's language and presentation. It was not used to generate the technical content, research findings, or references. The author reviewed the revised manuscript and takes full responsibility for its content, accuracy, and integrity.

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