

Enterprise Resource Planning Systems

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List of ERP-Related Journals

1. "Using Optimization Models for Scheduling in Enterprise Resource Planning Systems," by Frank Herrmann.
2. "Job Characteristics and Job Satisfaction: Understanding the Role of Enterprise Resource Planning System Implementation," by Michael G. Morris and Viswanath Venkatesh.
3. "How Do Enterprise Resource Planning Systems Affect Firm Risk? Post-Implementation Impact," by Feng Tian and Sean Xin Xu.
4. "Enterprise Resource Planning Systems, Management Control and the Quest for Integration," by Niels Dechow and Jan Mouritsen.
5. "An Empirical Investigation of Knowledge Management Competence for Enterprise Resource Planning Systems Success," by Mahmoud Mohammad Migdadi and Mohammed Khair Saleem Abu Zaid.

Introduction

Enterprise Resource Planning systems integrate major organizational processes through a common information architecture. Typical modules support finance, procurement, inventory, manufacturing, sales, human resources, projects, and reporting. The promise is that data entered in one process becomes available to authorized users elsewhere, reducing duplicate records and enabling coordinated decisions. (Dechow & Mouritsen, 2005)

ERP is not simply accounting software or a technical installation. It changes workflows, responsibilities, controls, performance measures, and the timing of information. Benefits emerge only when the organization aligns process design, data governance, people, and technology. The selected article by Tian and Xu is valuable because it examines an outcome often overlooked in ERP research: firm risk after implementation. (Tian & Xu, 2015)

What an ERP System Integrates

Before ERP, departments may maintain separate applications and spreadsheets. A sales order might be re-entered into inventory, production, shipping, and finance systems, creating delay and inconsistency. An integrated ERP links the transaction across modules. Inventory availability can affect promised delivery, production demand, purchasing requirements, revenue recognition, and cash planning. (Dechow & Mouritsen, 2005)

Integration does not mean that every process becomes identical. Organizations configure workflows, roles, approval limits, charts of accounts, product structures, and local requirements. Excessive customization can make upgrades difficult, while rigid standardization can force unsuitable processes. Implementation requires deliberate choices about where to adopt standard practice and where differentiation creates real value.

Summary of Tian and Xu's Research Question

Tian and Xu ask how ERP systems affect firm risk after implementation. Earlier studies often focused on productivity, financial performance, or market response. Their study shifts attention to variability and uncertainty. An information system can create value not only by increasing average performance but also by reducing the likelihood or magnitude of undesirable fluctuations. (Tian & Xu, 2015)

The authors analyze a large panel of firm-year observations and compare risk outcomes associated with ERP adoption. Their argument is that integrated information, process visibility, and coordination can help organizations anticipate disruptions and respond consistently. The effect may be especially important in uncertain environments where fragmented information makes decision-making slower. (Tian & Xu, 2015)

How ERP Can Reduce Operational Risk

ERP can reduce risk by creating common transaction rules and making exceptions visible. Inventory balances, purchase commitments, production orders, customer demand, and financial exposure can be analyzed together. Managers are less dependent on manually reconciled reports that arrive after a problem has expanded. (Tian & Xu, 2015)

Standard workflows can enforce approvals and segregation of duties. A purchase may require authorization based on amount, supplier, budget, or category. System logs create evidence of who performed an action and when. These controls reduce some errors and unauthorized transactions, although poor configuration can automate weak controls instead of improving them.

Functional Scope and Risk Reduction

Tian and Xu's findings suggest that broader functional implementation can strengthen the risk-reduction effect. When only one module is installed, information remains fragmented. Integration across operational and functional areas allows decisions in one department to reflect consequences elsewhere. (Tian & Xu, 2015)

However, broader scope also increases implementation complexity. More users, data objects, interfaces, and controls must be coordinated. Risk may rise during transition if the organization

attempts a large deployment without adequate testing or support. The relationship between scope and value is therefore conditional on implementation capability.

Environmental Uncertainty

The article argues that ERP's effect becomes more valuable when environmental uncertainty is high. In volatile markets, firms need current information about demand, supply, capacity, cost, and cash. Integrated data can shorten the time between change and response. Scenario planning and exception reporting can support decisions about inventory, sourcing, and production. (Tian & Xu, 2015)

Yet ERP does not predict the future. If input data is delayed or inaccurate, integrated reports may create false confidence. External shocks can also fall outside the assumptions built into planning models. Organizations need judgment, local knowledge, and alternative plans alongside system-generated recommendations.

Post-Implementation Rather Than Go-Live

Go-live is the beginning of ERP value creation, not the end. Early periods often involve data correction, workarounds, training needs, and performance problems. Post-implementation management includes stabilizing processes, measuring adoption, improving reports, updating controls, and deciding which customizations should be removed or retained. (Tian & Xu, 2015)

A center of excellence can coordinate process ownership, data standards, release management, user support, and benefit tracking. Without ownership, departments may recreate spreadsheets and shadow systems, gradually weakening integration.

Data Quality as a Risk Factor

ERP depends on master data such as customers, suppliers, products, prices, bills of materials, employee records, and accounts. Duplicate or inaccurate master data spreads across modules. A wrong unit of measure can distort purchasing and inventory; an incorrect bank record can redirect payment; a missing lead time can create production shortages.

Data governance should define owners, validation rules, approval processes, retention, and monitoring. Migration from legacy systems requires profiling, cleansing, reconciliation, and sign-off. Data quality is not a one-time technical task because new errors can enter through ordinary operations.

Cybersecurity and Access Risk

Integration concentrates valuable information and business capability. A compromised privileged account may affect finance, procurement, payroll, and supply chain. ERP security therefore requires role-based access, segregation of duties, strong authentication, secure interfaces, logging, patching, and monitoring.

Cloud ERP changes responsibility but does not remove it. The provider may operate infrastructure, while the customer remains responsible for identity, configuration, data, integrations, and user behavior. Contracts should address availability, incident notification, data location, backup, exit, and audit rights.

Implementation Failure Modes

ERP projects fail when organizations treat them as software installation rather than organizational change. Common problems include unclear sponsorship, unrealistic schedules, weak process decisions, excessive customization, inadequate testing, poor data migration, insufficient training, and failure to involve users.

Consultants can provide expertise, but ownership cannot be outsourced. Internal leaders must understand design decisions and maintain the system after external teams leave. A project that meets its launch date but produces workarounds, delayed closing, or dissatisfied users has not fully succeeded.

Business Process Reengineering

ERP implementation creates an opportunity to examine why work is performed in a particular way. Some legacy steps exist only because old systems could not share information. Removing unnecessary approvals or duplicate entry can improve performance. Other controls exist for legal, safety, or ethical reasons and should not be discarded for speed.

Business process reengineering should be evidence-based and participatory. Frontline employees often understand exceptions that diagrams miss. Process owners should distinguish value-adding variation from accidental complexity.

Job Characteristics and Employee Experience

Morris and Venkatesh show that ERP implementation can change job autonomy, task significance, feedback, and satisfaction. Standardization may reduce discretion for some employees while

providing clearer information and less repetitive entry for others. Resistance is not necessarily ignorance; it may reflect genuine loss of expertise, status, or control. (Morris & Venkatesh, 2010)

Training should explain both procedures and purpose. Users need realistic practice with exceptions, not only ideal demonstrations. Feedback after launch helps identify where system design conflicts with actual work.

Knowledge Management Competence

ERP knowledge includes technical configuration, process rules, data definitions, and organizational history. When this knowledge remains with a few consultants or employees, turnover creates risk. Documentation, communities of practice, cross-training, and structured handover preserve capability. (Migdadi & Abu Zaid, 2016)

Knowledge management also supports upgrades. Teams need to understand why a customization exists before deciding whether a new standard function can replace it. Institutional memory reduces repeated mistakes. (Migdadi & Abu Zaid, 2016)

Management Control and the Quest for Integration

Dechow and Mouritsen caution that integration is not a simple final state. ERP changes what managers can see and how accountability is constructed. A single database may create consistency, but organizations still interpret figures differently and negotiate priorities. (Dechow & Mouritsen, 2005)

Reports should not be treated as objective merely because they come from ERP. Accounting rules, allocation methods, master data, and process timing shape the numbers. Managers need both system literacy and critical judgment. (Dechow & Mouritsen, 2005)

Scheduling and Optimization

Herrmann's work on scheduling shows how optimization can extend ERP planning. Models can help sequence jobs, allocate resources, or reduce lateness. Their usefulness depends on accurate constraints, processing times, priorities, and capacity data. (Herrmann, 2016)

A mathematically optimal schedule may be operationally impossible when it ignores maintenance, worker skills, quality checks, or uncertainty. Optimization should support planners rather than conceal assumptions. (Herrmann, 2016)

Evaluation of the Selected Article

Tian and Xu expand ERP research by showing that value can appear through lower performance volatility and risk, not only higher average returns. Their large-sample design provides evidence beyond individual case studies. The focus on post-implementation is especially important because organizations often stop evaluating benefits after launch. (Tian & Xu, 2015)

Limitations remain. Firms that implement ERP may differ from non-adopters in management quality, resources, or strategy. Measures of implementation scope may not capture configuration quality or actual use. Statistical association cannot explain every mechanism. Case research and process-level data can complement the findings.

Self-Reflection

The article changes my understanding of ERP from a system that mainly accelerates transactions to an infrastructure that can influence organizational risk. Integration can reduce uncertainty by improving visibility and control, but it also creates concentration risk. A single poorly governed platform can spread bad data or disruption across the company. (Tian & Xu, 2015)

I therefore agree with the authors' conclusion that ERP can reduce firm risk, but only conditionally. Human skill, data quality, process ownership, cybersecurity, training, and post-implementation governance determine whether the technology supports resilience. Managers should evaluate ERP by asking not only whether it is running, but whether decisions are better, controls are stronger, and the organization can recover from failure. (Tian & Xu, 2015)

Conclusion

ERP systems integrate processes and data across organizational functions. Tian and Xu provide evidence that this integration can reduce firm risk after implementation, particularly when functional scope is broad and environmental uncertainty is high. The result is not automatic. Poor planning, customization, data, security, or change management can create new risks. Sustainable value requires continuous governance after go-live, including process improvement, access control, knowledge retention, and measurement of benefits. (Tian & Xu, 2015)

References

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