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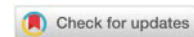
Business Information Systems and Software Tools: Global Applications, Cost Savings, and Data Storage Infrastructure

Vladimir Đokić¹, Dragana Đokić¹, Aleksandar Gračanac²

¹Faculty of Informatics and Computer science, University Union—Nikola Tesla, Belgrade, Serbia

²Faculty for Entrepreneurial Business and Real Estate Management, Faculty of Economics and Finance, University Union—Nikola Tesla, Belgrade, Serbia

e-mail: vladimirdjokic001@gmail.com, draganadjokic@unionnikolatesla.edu.rs, agracanac@unionnikolatesla.edu.rs



Abstract: Business information systems (BIS) constitute the technological foundation of modern organizations, integrating data management, process automation, and decision-support capabilities within a unified operational architecture. This paper examines the role of contemporary software tools in supporting BIS across diverse organizational contexts, with particular emphasis on measurable cost savings, data storage infrastructure, and mobile computing solutions. Through a comparative analysis of widely deployed enterprise platforms — including ERP, CRM, and business intelligence systems — the study demonstrates that the strategic selection and implementation of appropriate BIS software tools yields documented reductions in operational costs of between 15 and 40 percent, depending on organizational size and sector. The paper further analyzes data storage approaches spanning on-premise servers, private and public cloud environments, and mobile computing centers, assessing each model's suitability, scalability, and cost efficiency across varying operational conditions. The findings indicate that no single infrastructure model is universally optimal; rather, hybrid deployments combined with context-specific software selection consistently produce the greatest efficiency gains. A structured framework for aligning software tool selection with organizational goals, data governance requirements, and financial constraints is proposed.

Keywords: *business information systems, enterprise software, ERP, CRM, cloud computing, data storage, cost savings, mobile computing center, data infrastructure.*

Introduction

The contemporary business environment is shaped by an accelerating pace of technological change, rapidly growing volumes of operational data, and an increasing organizational dependence on software-driven decision-making. Business information systems (BIS) have evolved considerably over the past two decades, transforming from simple record-keeping applications into complex, integrated platforms that span every functional area of an organization — from supply chain management and human resources to customer relationship management and strategic analytics. The proliferation of cloud-based software, open-source enterprise solutions, and mobile computing infrastructure has substantially lowered the barriers to sophisticated BIS adoption, enabling organizations of all sizes to access tools that were previously available only to large corporations.

Despite the growing availability of BIS software tools, many organizations continue to encounter difficulties in selecting, implementing, and fully utilizing systems that are genuinely aligned with their operational objectives, data governance obligations, and financial constraints. The literature on enterprise software adoption consistently identifies misalignment between tool capabilities and organizational needs as a primary driver of implementation failure, budget overrun, and underutilized investment (Panorama Consulting Group, 2023; Forrester Research, 2024).

This paper addresses three interconnected research questions. First, which categories of BIS software tools are currently most widely deployed across different organizational types, and what are their defining functional characteristics? Second, what cost savings are documented in the literature as attributable to strategic BIS software adoption, and how do these savings vary by sector and organizational scale? Third, how do different data storage and computing infrastructure models — including traditional on-premise servers, cloud environments, and mobile computing centers — compare in terms of scalability,

¹Corresponding author: vladimirdjokic001@gmail.com



reliability, and total cost of ownership?

The paper proceeds as follows. Section two presents a theoretical overview of BIS architecture and the principal categories of enterprise software tools. Section three reviews the evidence on cost savings attributable to BIS adoption. Section four analyzes data storage infrastructure options relevant to BIS deployment, including an examination of mobile computing center implementations in Serbia. Section five discusses the implications for organizational practice. The paper concludes with a summary of the key findings and directions for future research.

Business Information Systems: Architecture and Software Categories

A business information system is most broadly defined as an organized combination of hardware, software, data, processes, and human resources designed to collect, process, store, and transmit information in support of organizational decision-making and operations (Laudon & Laudon, 2022). At the architectural level, BIS typically consist of three functional layers: a data layer encompassing databases, data warehouses, and data lakes; a processing layer comprising application logic, workflow engines, and integration middleware; and a presentation layer including user interfaces, reporting dashboards, and analytical visualizations.

Contemporary BIS software tools can be grouped into five primary functional categories:

- Enterprise Resource Planning (ERP) systems, which integrate core business processes — including finance, procurement, manufacturing, and human resource management — into a unified data environment, eliminating data silos and enabling cross-functional reporting.
- Customer Relationship Management (CRM) platforms, which manage customer interactions, automate sales pipeline tracking, and coordinate marketing campaigns across digital and physical channels.
- Business Intelligence (BI) and analytics tools, which transform raw operational data into actionable management insights through data visualization, ad-hoc reporting, and predictive modeling.
- Supply Chain Management (SCM) systems, which optimize procurement workflows, logistics coordination, inventory replenishment, and supplier relationship management.
- Human Capital Management (HCM) platforms, which support talent acquisition, payroll processing, employee performance evaluation, and workforce planning.

Table 1 provides a comparative overview of five enterprise BIS platforms currently in widespread use, summarizing the vendor, deployment model, primary functional domain, and cost structure of each.

Table 1. Comparative overview of major BIS software platforms (2024).

Software	Vendor	Deployment	Primary Function	Cost Model
SAP S/4HANA	SAP SE	Cloud / On-prem	ERP / Finance	Subscription
Oracle ERP Cloud	Oracle Corp.	Cloud	ERP / HCM	Subscription
MS Dynamics 365	Microsoft	Cloud	CRM / ERP	Per-user / month
Odoo	Odoo S.A.	Cloud / On-prem	ERP (SME focus)	Freemium + add-ons
Zoho One	Zoho Corp.	Cloud	CRM / Analytics	Flat monthly rate

Note: Deployment models and pricing structures are subject to vendor updates. Data compiled from vendor documentation and Panorama Consulting Group (2023).

The BIS software market is increasingly concentrated among a small number of dominant vendors — notably SAP, Oracle, and Microsoft — while a parallel ecosystem of specialized and open-source alternatives, such as Odoo and ERPNext, continues to mature and is particularly relevant for small and medium-sized enterprises (SMEs). Cloud-based deployment has become the default model for new implementations, driven by lower upfront capital expenditure, accelerated deployment timelines, and built-in horizontal scalability (Gartner, 2024).

A significant trend reshaping BIS software development is the integration of artificial intelligence (AI) and machine learning capabilities into core platform functions. Predictive demand forecasting, automated invoice processing, natural language query interfaces, and real-time anomaly detection in financial transactions are now standard features in leading ERP and BI platforms. This integration is

progressively shifting the function of BIS from retrospective operational reporting toward forward-looking organizational intelligence (Davenport & Ronanki, 2018).

Cost Savings Through Strategic BIS Software Adoption

One of the primary justifications for BIS investment is the expectation of measurable reductions in operational expenditure. The empirical literature on BIS adoption outcomes consistently documents significant savings across multiple cost categories, although the magnitude and distribution of these savings vary substantially depending on organizational type, implementation quality, and the specific business processes targeted for optimization.

Cost savings attributable to BIS software adoption characteristically manifest across three categories:

- Process automation savings: The replacement of manual, labor-intensive workflows — such as invoice matching, payroll calculation, and inventory replenishment — with automated processes reduces both direct labor costs and the expense of correcting errors introduced by manual handling.
- Procurement and supply chain optimization: Integrated ERP and SCM systems enable organizations to consolidate supplier relationships, negotiate more favorable contract terms, reduce safety stock levels, and minimize waste from demand-supply mismatches.
- IT infrastructure rationalization: Migration to cloud-based BIS platforms eliminates the capital expenditure associated with on-premise hardware maintenance, reduces software licensing complexity, and enables right-sizing of computing resources according to actual organizational usage patterns.

Table 2 summarizes documented cost savings drawn from peer-reviewed literature and industry research across a range of organizational types and BIS platforms.

Table 2. Documented cost savings associated with BIS software adoption across organizational types.

Organization	Tool / Platform	Savings Area	Documented Saving	Source
Large enterprise	SAP S/4HANA	Procurement cost	18–24 %	Panorama, 2023
Mid-size retail	MS Dynamics 365	Inventory waste	15 %	Forrester, 2024
SME (services)	Zoho CRM	Customer acquisition	22 %	Zoho, 2023
Public sector	Open-source ERP	IT licensing fees	30–40 %	EC Report, 2022

Note: Savings figures represent reported averages or ranges. Actual outcomes depend on implementation quality, organizational readiness, and sector-specific characteristics.

The results in Table 2 indicate that the largest savings are typically achieved in procurement and supply chain management, where integrated data visibility enables organizations to identify and eliminate redundant expenditure and reduce supply chain latency. Public sector organizations adopting open-source ERP solutions report particularly high IT licensing savings, as proprietary software licensing fees constitute a disproportionate share of their total IT operating budgets (European Commission, 2022).

Cost savings from BIS adoption are not automatic outcomes of software selection. Research consistently identifies several enabling conditions without which the anticipated financial benefits are unlikely to materialize: executive sponsorship, adequate change management investment, accurate and complete master data, and sufficient training for end users (Panorama Consulting Group, 2023). Organizations that underinvest in these areas frequently experience the well-documented phenomenon of post-implementation disappointment, in which the system operates technically but fails to deliver the expected business value.

Beyond direct cost reduction, BIS adoption is associated with indirect financial benefits that are more difficult to quantify but potentially of equal significance, including faster financial close cycles, improved regulatory compliance, reduced internal and external audit costs, and enhanced organizational capacity for data-driven strategic planning (Turban et al., 2021). As organizations accumulate operational experience with their BIS platforms, the efficiency gains associated with system usage compound over

time, producing a progressive return on the initial implementation investment.

Data Storage and Computing Infrastructure for BIS

The performance, security, and cost efficiency of a business information system are fundamentally determined by the underlying data storage and computing infrastructure on which it operates. As organizational data volumes expand — driven by transactional records, IoT sensor outputs, customer interaction logs, and regulatory archiving obligations — the selection of an appropriate storage architecture has become a strategic organizational decision rather than a purely technical one.

Five infrastructure models are most relevant for BIS deployment in contemporary organizations:

- **On-premise servers:** Physical computing and storage hardware maintained within the organization's own facilities. This model offers maximum control over data sovereignty and security configuration, but requires substantial capital investment and dedicated IT personnel for ongoing maintenance and technology refresh.

- **Private cloud:** Virtualized computing resources hosted within the organization's own data center or by a managed service provider on a dedicated, single-tenant basis. Private cloud provides greater operational flexibility than on-premise hardware while retaining a higher degree of data control than shared public cloud environments.

- **Public cloud (AWS, Microsoft Azure, Google Cloud):** Infrastructure delivered as a metered, on-demand service by hyperscale cloud providers. This model provides near-unlimited horizontal scalability, pay-per-use pricing transparency, and very high reliability guarantees, but introduces considerations regarding data sovereignty, vendor dependency, and regulatory compliance in jurisdictions with strict data localization requirements.

- **Mobile computing center:** A portable, self-contained computing and storage unit designed for deployment in environments where fixed physical infrastructure is unavailable or operationally impractical. Contemporary mobile computing centers — such as those introduced at the University of Kragujevac (komp.KG) for decentralized academic computing — integrate ruggedized servers, uninterruptible power systems, and satellite or cellular wide-area network connectivity to deliver enterprise-grade BIS capabilities in field conditions.

- **Hybrid infrastructure:** A deliberate combination of on-premise resources and cloud services, with workload distribution governed by data sensitivity classification, latency requirements, and cost optimization targets.

Table 3 compares these infrastructure models across the dimensions most relevant to BIS deployment: scalability, service-level agreement (SLA) uptime commitments, approximate storage cost, and representative organizational use cases.

Table 3. Comparison of data storage and computing infrastructure models for BIS deployment.

Infrastructure	Scalability	SLA Uptime	Cost / TB / yr	Typical Use Case
On-premise server	Low	99.5 %	High (CAPEX)	Legacy / regulated systems
Private cloud	Medium	99.9 %	Medium	Sensitive data industries
Public cloud (AWS / Azure)	Very high	99.99 %	Low (OPEX)	Startups, SaaS platforms
Mobile computing center	Medium	99.7 %	Variable	Field ops, disaster recovery
Hybrid (cloud + on-prem)	High	99.95 %	Medium–low	Enterprise standard model

Note: Cost per TB/yr figures are indicative and vary by provider, geographic region, and contract terms. SLA figures represent typical vendor commitments, not guaranteed minimums.

The data in Table 3 reveal a consistent pattern of trade-offs: infrastructure models that provide the greatest control and data sovereignty (on-premise, private cloud) impose higher costs and lower scalability, while those offering the greatest scalability and lowest per-unit storage costs (public cloud) require acceptance of shared infrastructure, reduced control over data residency, and greater dependence

on vendor reliability. The hybrid model has emerged as the pragmatic enterprise standard, enabling organizations to retain sensitive or latency-critical workloads on controlled infrastructure while leveraging public cloud elasticity for variable or less sensitive functions (Gartner, 2024).

Mobile computing centers represent a specialized infrastructure category whose relevance is increasing across sectors characterized by geographic dispersion, infrastructure scarcity, or strict requirements for operational continuity under failure conditions. Modern mobile computing centers are capable of hosting enterprise-grade BIS applications and synchronizing with central cloud infrastructure when wide-area network connectivity is available. Their application in disaster recovery planning allows organizations to maintain BIS availability even when primary data center facilities are offline or inaccessible (NIST, 2021).

The selection of an appropriate storage and computing model should be driven by a structured analysis of four organizational parameters: the regulatory classification and sensitivity of the data to be stored; the performance requirements of the BIS workloads in terms of latency, throughput, and availability; the organization's internal IT capacity for infrastructure management and security oversight; and the projected total cost of ownership over a multi-year planning horizon, accounting for both capital and operational expenditure trajectories.

Discussion

The findings of this review support several conclusions relevant to practitioners and researchers working at the intersection of business information systems, software tool selection, and infrastructure management.

First, the evidence strongly supports the conclusion that strategic BIS software adoption generates measurable cost savings, but only when implementation is accompanied by adequate organizational change management and realistic expectations of the implementation timeline. The documented savings range of 15–40 percent across procurement, inventory, and IT licensing costs represents a compelling investment case, yet the literature is equally consistent in demonstrating that these outcomes are contingent on implementation quality rather than the intrinsic capabilities of the selected software platform.

Second, the contemporary BIS software landscape offers considerably broader and more accessible options than were available a decade ago. The maturation of cloud-based deployment models and the improving quality of open-source enterprise platforms have meaningfully expanded the choices available to SMEs, which were previously largely restricted to basic accounting systems or prohibitively expensive proprietary ERP deployments. This democratization of BIS access is likely to accelerate as AI-driven automation progressively reduces the configuration and maintenance complexity of enterprise software.

The integration of software tools into organizational environments extends beyond strictly operational contexts. As Đokić (2026) observes, “the teaching practices applied in contemporary higher education institutions increasingly depend on various encapsulated software solutions, including learning management systems (LMS), digital collaboration platforms, visualization and simulation tools, as well as systems for assessing students' knowledge” (p. 1). This observation is equally applicable to corporate training and knowledge management functions embedded within modern BIS architectures, where learning and talent development platforms are increasingly integrated with core ERP and HCM systems. Furthermore, Đokić (2026) emphasizes that “it is necessary to comprehensively and structuredly explain the ways in which the integration of such tools affects learning outcomes, student motivation and engagement, and overall effectiveness” (p. 1) — a principle that translates directly to the organizational context, where employee adoption of new BIS tools is a decisive factor in whether the anticipated efficiency gains are realized in practice.

Third, the question of data storage infrastructure is increasingly inseparable from BIS software selection decisions. Modern enterprise software platforms are designed around specific infrastructure assumptions — typically cloud-native architectures — and deviations from these assumptions impose performance penalties and additional integration expenditure. Organizations that treat infrastructure selection as a downstream, implementation-phase decision rather than an upstream strategic-planning decision consistently encounter avoidable technical and financial difficulties.

Fourth, mobile computing centers — while occupying a specialized position in the overall BIS infrastructure landscape — merit increasing attention, particularly in contexts characterized by geographic remoteness, regulatory restrictions on cross-border data transfer, or requirements for operational continuity under infrastructure failure conditions. As these systems continue to increase in computing power and improve in cloud synchronization capabilities, their relevance as a component of enterprise hybrid BIS architectures is likely to grow substantially.

Conclusion

This paper has examined the intersection of business information systems, enterprise software tool selection, and data storage infrastructure, with particular attention to the practical implications for organizational cost management and operational continuity. Three principal contributions emerge from the analysis.

First, a structured comparative overview of five major BIS software platforms was presented, covering functional scope, deployment model, and cost structure. This comparison provides a practical reference for organizations at early stages of BIS software evaluation, enabling more informed initial scoping of candidate solutions.

Second, empirical evidence on cost savings attributable to strategic BIS software adoption was synthesized from industry and peer-reviewed literature. The findings demonstrate that well-implemented systems consistently yield savings of 15–40 percent in targeted cost categories — most significantly in procurement, inventory management, and IT licensing — while also producing indirect benefits in regulatory compliance, financial reporting speed, and organizational decision quality.

Third, a comparative framework for evaluating data storage and computing infrastructure models was developed, encompassing on-premise servers, private and public cloud environments, mobile computing centers, and hybrid architectures. The framework clarifies the fundamental trade-offs between data control, operational scalability, cost efficiency, and infrastructure flexibility that organizations must navigate when designing a BIS infrastructure strategy.

Future research should examine the trajectory of AI integration into BIS platforms and its implications for software selection, particularly as the functional boundaries between ERP, CRM, BI, and SCM systems continue to erode. Longitudinal studies tracking the realized cost savings and operational impacts of BIS implementations over periods of five years or more would also contribute substantially to the evidence base, complementing the shorter-term figures currently available in the practitioner and academic literature.

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