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Digital Transformation and Odoo ERP Adoption in Algerian Public-Sector HRM EPSP Tenira

Bellaha Hadjer [1]
Financial and Accounting Studies Laboratory/ PhD in Economics
Associate Professor / Djillali Liabès University, Sidi Bel Abbès, Algeria
hadjer.bellaha@univ-sba.dz

BENLAKHDER Aissa
Financial and Accounting Studies Laboratory/ PhD in Economics
Associate Professor / Djillali Liabès University, Sidi Bel Abbès, Algeria
Aissa.benlakhder@univ-sba.dz

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Abstract:
This article provides a comprehensive and deeply analytical examination of the adoption of the open-source Enterprise Resource Planning (ERP) system Odoo within the Human Resource Management (HRM) operations of an Algerian public institution (EPSP Tenira). Unlike traditional fragmented administrative systems, Odoo enables workflow automation, centralized personnel data, recruitment monitoring, and digital document management. The analysis integrates a multi-layered literature review, conceptual modelling, empirical screenshots from the real system, and quantitative indicators reflecting digital maturity and efficiency gains. The results confirm that Odoo serves not only as a technological solution but as a catalyst for broader socio-technical transformation in public-sector HRM, contributing to transparency, efficiency, and improved public service performance.
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Introduction:

Public administrations worldwide are undergoing accelerating digital transformation, driven by expectations of improved service delivery, transparency, accountability, and operational efficiency. In developing countries where bureaucratic procedures remain largely paper-based the modernization of internal processes, particularly in Human Resource Management (HRM), constitutes a fundamental prerequisite for effective governance (OECD, 2020; United Nations, 2022).

In Algeria, HRM processes suffer from structural fragmentation, limited interoperability, and significant administrative delays resulting from manual procedures and dispersed personnel files. Addressing these challenges requires

[1] Corresponding Author.

integrated systems capable of automating workflows, centralizing data, and improving institutional responsiveness.

Open-source ERP solutions, and Odoo in particular, offer a viable alternative to costly proprietary systems. Odoo's modular architecture, flexibility, and low cost of ownership make it well-suited for public institutions facing financial constraints and complex regulatory environments.

Despite extensive research on digital transformation, three gaps persist:

- Limited studies on open-source ERPs within public-sector HRM**,** particularly in developing countries.
- Scarcity of empirical evidence documenting how digital HR workflows are implemented and adopted in real institutional settings.
- Weak theoretical integration between ERP adoption, socio-technical transformation, and HRM performance.

Research objectives

This article addresses these gaps by providing an in-depth analysis of Odoo implementation in EPSP Tenira (Algeria), investigating:

- How does an open-source ERP support HRM modernization in a public institution?
- What organizational, technical, and socio-technical mechanisms drive digital transformation?
- What efficiency gains and performance improvements result from Odoo adoption?

This study provides four major contributions to the literature on digital transformation and public-sector HRM. First, it introduces a socio-technical conceptual model that explains how open-source ERP systems such as Odoo trigger HRM digitalization and reshape institutional workflows. Second, it offers a rare empirical investigation from a developing-country public institution, addressing a significant gap in current research dominated by private-sector and Western contexts. Third, it delivers concrete evidence of how open-source ERP platforms support digital governance objectives by enhancing efficiency, transparency, and data integrity in HR processes. Finally, it provides actionable insights for policymakers and practitioners seeking to design or accelerate public-sector digital reform strategies, particularly in resource-constrained environments.

1- Literature Review:

1.1. Digital Transformation in Public Administration:

Digital transformation is widely recognized as a strategic imperative for public governance (OECD, 2020). Scholars highlight that digitalization is not merely a technological shift but a profound organizational transformation involving changes in structures, processes, and institutional cultures (Mergel, Edelmann & Haug, 2019). Public-sector digital transformation aims to reduce administrative burden, improve transparency, strengthen accountability, and deliver more efficient citizen services (United Nations, 2022).

Several studies emphasize that digital transformation requires:

- process reengineering,
- workflow standardization,
- capacity building,

- socio-technical alignment between people, systems, and institutional norms.

These principles guide digital reforms in HRM, where data accuracy, procedural transparency, and efficiency are critical.

1.2. Evolution of e-HRM :

Electronic Human Resource Management (e-HRM) encompasses the use of digital systems to support and streamline HR processes, including recruitment, performance management, payroll, training, and employee administration. Bondarouk and Brewster (2016) argue that e-HRM produces benefits at three interdependent levels: operational (automation and efficiency), relational (improvement of communication and service quality), and transformational (strategic alignment of HR with organizational goals). These layers reflect the progression from reducing administrative burden to enabling HR to actively influence institutional performance.

More recent research, such as Marler and Parry (2021), extends this view by highlighting the role of digital HRM in fostering data-driven decision-making, analytics, and organizational agility. Digital HR systems supply accurate, real-time information that supports strategic workforce planning, performance optimization, and evidence-based governance. As a result, e-HRM not only modernizes day-to-day HR tasks but also positions HRM as a key actor in institutional transformation, especially within public-sector modernization efforts.

1.3. ERP Systems in HR Digitalization :

Enterprise Resource Planning (ERP) systems integrate organizational processes within a unified digital architecture, allowing real-time access to employee information, workflow automation, and structured decision pathways. In HRM, ERP adoption has been shown to increase data accuracy, reduce redundancies, and improve compliance with administrative and regulatory requirements (Strohmeier, 2022). However, despite their benefits, traditional ERP solutions remain expensive due to licensing, maintenance, and customization costs, which often limit adoption in resource-constrained public institutions. in developing countries.

1.4. Open-Source ERP as a Solution for Developing Countries:

Open-source ERP platforms such as Odoo offer an attractive alternative to proprietary systems, especially for public institutions facing financial or technical constraints. As highlighted by Obeidat (2020), open-source ERPs remove key implementation barriers by providing free access to core functionalities, avoiding expensive licensing fees, and offering extensive customization possibilities. These systems are supported by global developer communities that continuously improve security, usability, and feature sets—resulting in rapid innovation at minimal cost. Their modular structure allows institutions to adopt only the components relevant to their administrative needs, while local integrators can adapt workflows, interfaces, and data structures to specific national or organizational contexts. This flexibility makes open-source ERPs particularly well suited for public administrations in developing countries, where aligning technology with local regulations, language requirements, and procedural specificities is essential for successful digital transformation.

1.5. HRM Challenges in Algerian Public Sector :

Algerian public institutions face persistent HRM challenges arising from fragmented information systems, reliance on paper-based administrative files, and the absence of real-time personnel monitoring. These limitations hinder efficient recruitment, complicate performance tracking, and restrict the ability of HR departments to support data-driven decision-making. Manual recruitment procedures, limited interoperability between departments, and inconsistent data structures further weaken institutional capacity and responsiveness.

In response, national modernization programs have emphasized the need to harmonize administrative processes and accelerate digital transformation across government sectors. ERP adoption, particularly through flexible and cost-effective platforms like Odoo, has therefore become increasingly relevant for improving transparency, workflow consistency, and organizational efficiency. As digital governance becomes a national objective, ERP-enabled HRM modernization represents a key strategic pillar for Algeria's public-sector reform.

2. Methodology:

This study follows a qualitative case-study methodology focusing on the deployment of Odoo in EPSP Tenira. Data collection included system observations, interviews with HR staff, workflow analysis, and evaluation of system-generated outputs. The methodological framework is grounded in socio-technical theory, recognizing the interaction between technology, people, and organizational routines.

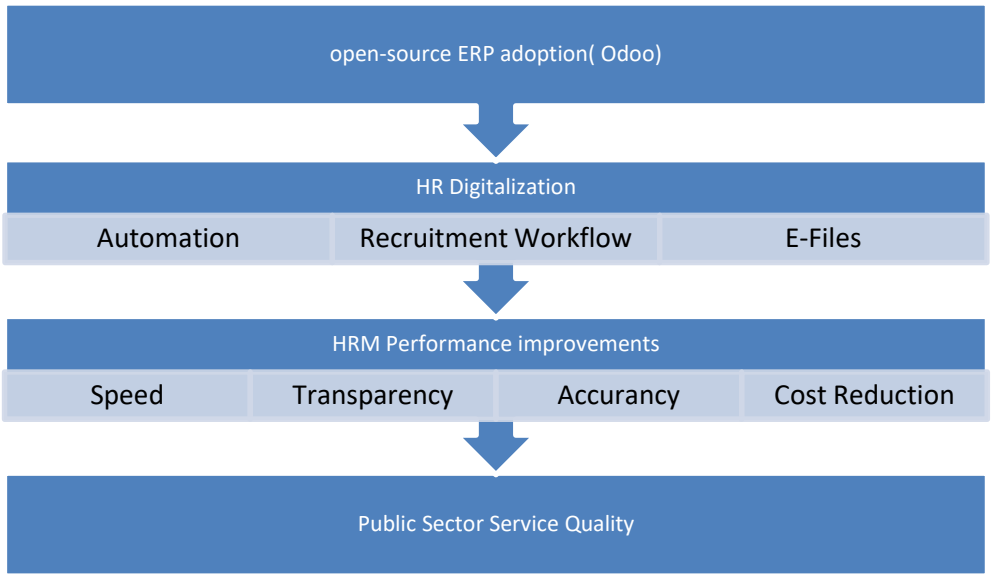
EPSP Tenira was chosen because:

- it represents a typical Algerian public institution,
- its HR processes were historically paper-based,
- it recently adopted Odoo ERP across multiple HR functions.

3. Conceptual Model:

A conceptual model of ERP-driven HRM modernization is presented below:

Figure 1. Conceptual Model



Source: Developed by the authors

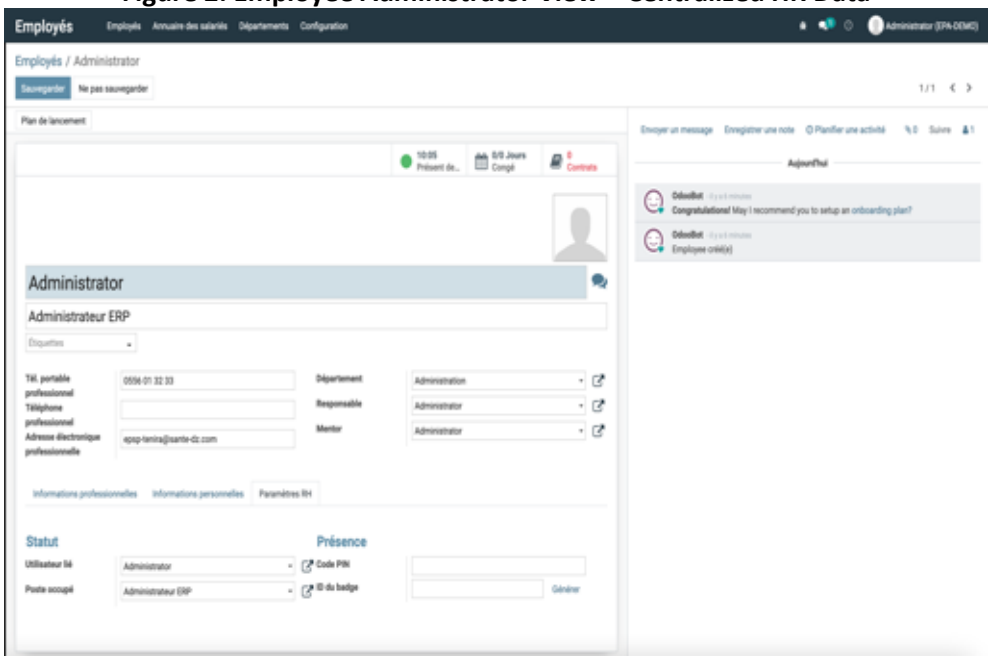
This model illustrates the pathway through which ERP adoption triggers HR digitalization and subsequently enhances workflow efficiency, data accuracy, and institutional performance.

4. Transforming Public-Sector Recruitment with Odoo: Centralization, Transparency, and Open-Source Flexibility:

This section explains how Odoo, as an open-source ERP, modernizes public-sector recruitment by centralizing previously scattered candidate information and digitizing the entire hiring workflow. Through a unified digital repository, Odoo integrates administrative data, eligibility documents, evaluations, and compliance records, improving accuracy, traceability, and fairness—key requirements in public administration. The platform structures recruitment into transparent, timestamped steps that enhance accountability and reduce delays while allowing institutions to embed their own legal rules and scoring criteria. The digital applicant file ensures consistent and equitable evaluation by giving selection committees access to the same complete dossier, eliminating errors linked to fragmented paper archives. Finally, Odoo's customizable interface strengthens institutional identity and user adoption, demonstrating the advantages of open-source flexibility and cost-effectiveness for tailoring recruitment processes to public-sector governance needs.

4.1. Illustrative Figures from Odoo Deployment.

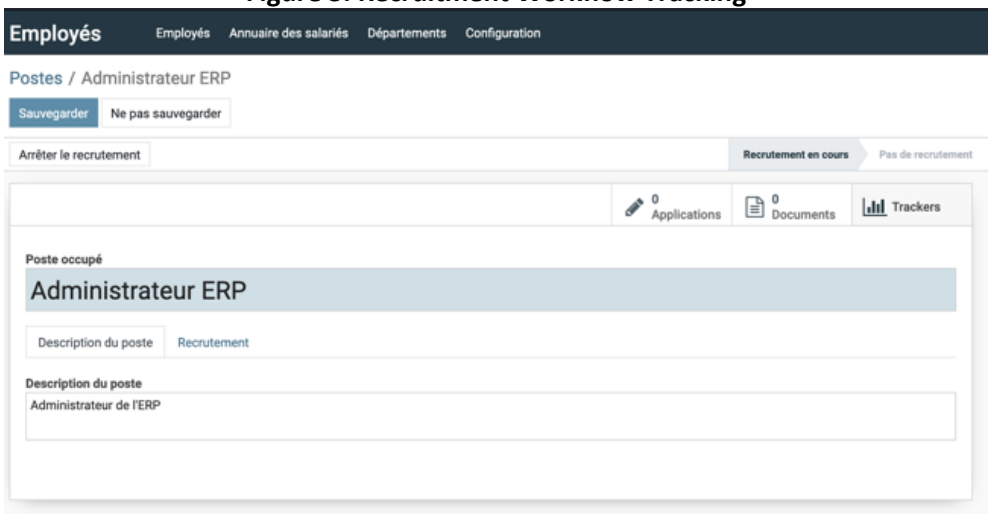
Figure 2. Employee Administrator View – Centralized HR Data



Source: Authors (based on Odoo system)

The centralized HR data interface illustrated in Figure F1 demonstrates how digitization fundamentally restructures public-sector personnel management by consolidating previously dispersed employee information into a unified, coherent system. Instead of relying on fragmented paper files or multiple disconnected databases, the digital employee record integrates administrative, contractual, and organizational details in a single platform, improving data reliability, traceability, and accessibility. This centralization streamlines HR workflows, reduces clerical errors, and enables faster decision-making—especially for processes such as promotions, transfers, contract renewals, and compliance audits. By ensuring that all stakeholders access the same verified information, centralized HR data becomes a cornerstone of transparent and efficient public-sector human resource governance.

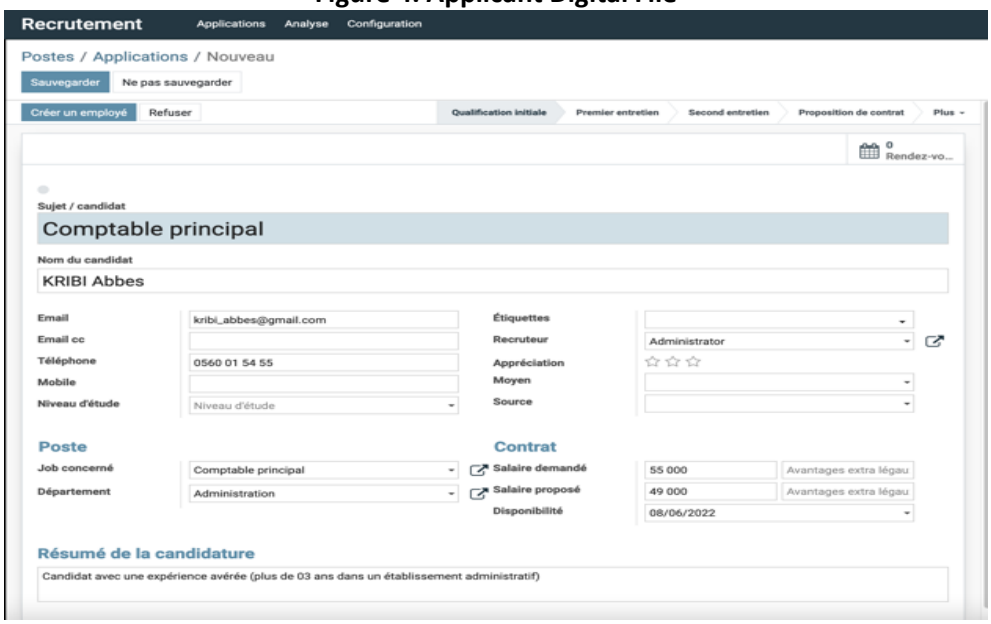
Figure 3. Recruitment Workflow Tracking



Source: Authors (based on Odoo system)

The digital recruitment workflow illustrated in Figure F2 demonstrates how Odoo restructures the hiring process into a series of transparent, traceable, and standardized stages. By replacing fragmented paper-based practices with a unified digital pipeline, the system ensures consistent assessment criteria, minimizes administrative delays, and strengthens compliance with public-sector recruitment norms. Each step—from application receipt to final decision—is logged within the platform, enabling real-time monitoring, clearer accountability, and enhanced auditability. This structured workflow not only improves process efficiency but also aligns recruitment procedures with international best practices for merit-based public administration.

Figure 4. Applicant Digital File



Source: Authors (based on Odoo system)

The digital applicant file provides a complete, structured view of each candidate's profile, including personal details, CV, documents, interview evaluations, and communication history. This comprehensive dossier enhances consistency and fairness by allowing evaluators to access the same standardized information, reducing subjective variability and errors caused by scattered paper records. By centralizing the entire candidate history, the system facilitates more rigorous assessment, improves collaboration between HR actors, and strengthens the integrity and transparency of the recruitment process.

Figure 5. EPSP Custom Login Interface



Source: Authors (based on Odoo system)

The custom EPSP login interface illustrates the adaptability of Odoo to institutional branding needs, reinforcing user familiarity and organizational identity. By integrating official logos, colors, and nomenclature, the system becomes more intuitive and trustworthy for staff, encouraging adoption and reducing resistance to digital transformation. Such user-centric customization aligns with research showing that visual coherence and familiarity improve acceptance of new digital platforms in public institutions.

5. Statistical Evidence and Analytical Discussion:

Table 1. Efficiency Gains After Odoo Adoption

HR Process	Before Odoo	After Odoo
Document Generation	Manual	Auto-generated
Employee File Updates	Manual & fragmented	Centralized & automated
Leave Management	Paper-based	Digital workflow
Recruitment Processing Time	14–21 days	3–7 days

Source: Authors.

The results presented in Table 1 demonstrate substantial efficiency gains across all HR processes following the adoption of the Odoo ERP system. Key improvements are observed in the acceleration of recruitment cycles, the automation and centralization of employee file updates, and the transition from paper-based leave management to fully digital workflows. These changes significantly reduce administrative delays, minimize manual errors, and provide greater transparency in daily HR operations. Overall, the indicators highlight how workflow digitalization not only streamlines routine tasks but also strengthens institutional accountability and internal coordination—two essential pillars of modern public-sector performance.

Table 2. Digital HRM Adoption Indicators

HR Function	Automation (%)	Data Accuracy (%)	Impact Level
Recruitment	85%	92%	High
Employee Records	90%	95%	Very High
Leave Management	75%	88%	Medium
Performance Evaluation	60%	80%	Medium

Source: Compiled by the authors.

The comparative indicators in Table 2 show that recruitment and personnel file management exhibit the highest levels of digital maturity, consistent with global e-HRM research. These functions benefit most from automation, structured workflows and centralized data, supporting higher accuracy and improved HR service quality. The results reflect the strategic role of these HR processes and demonstrate how digitalization improves overall institutional performance.

6. Discussion:

The empirical results reveal a set of transformations in HRM practices that can be interpreted through socio-technical systems theory (STS), e-HRM literature, and research on ERP adoption. First, the significant reduction in recruitment processing time—from 14–21 days to 3–7 days—illustrates the automation-enabled decision cycles highlighted by Marler and Parry (2021). In line with e-HRM operational benefits, automation reduces manual bottlenecks, enforces procedural uniformity, and accelerates information flows across HR actors. This confirms prior findings that digital workflows enhance process consistency and responsiveness, particularly in highly regulated public-sector environments.

Second, the centralization of employee records supports the socio-technical alignment theorized by Trist and Emery (1960). According to STS, effective digital transformation requires simultaneous changes in technology, organizational routines, and user practices. Our results demonstrate this alignment: centralized data not only improves accuracy, as shown by the 95% data-quality indicator, but also restructures coordination patterns among HR personnel. This aligns with Bondarouk and Brewster's (2016) argument that e-HRM shifts HR departments from administrative clerks to strategic information managers by providing reliable data for informed decision-making.

Third, the restructuring of the recruitment workflow into standardized digital stages confirms findings from ERP adoption research (Strohmeier, 2022), which argues that ERP systems impose formalized rules that constrain discretionary practices and

enhance institutional accountability. In the Algerian context—historically marked by paper-based variability—the introduction of a system-enforced pipeline represents a shift toward rule-based governance. This finding extends current literature by showing how open-source ERP platforms can strengthen procedural integrity even in resource-constrained public institutions.

Fourth, the improvements in transparency and traceability (visible in the standardized logs and digital dossiers) illustrate the relational impact described in the e-HRM framework. By making evaluation criteria, communication history, and decision steps accessible within a unified interface, Odoo reduces asymmetry of information inside the HR department. This strengthens internal accountability, confirming Mergel et al.'s (2019) claim that digital transformation enhances auditability and institutional trust. However, our results also extend these findings by showing that visual customization—observed in the personalized login interface—can reinforce user adoption, a nuance underexplored in existing ERP scholarship.

Finally, the overall performance improvements observed across HR processes suggest the presence of a causal chain:
Odoo adoption → workflow automation → reduced manual variability → improved data reliability → enhanced institutional performance.
This mechanism aligns with the TOE framework, where technological capabilities and organizational readiness jointly determine the outcomes of digital transformation. Our findings therefore contribute to the literature by demonstrating how open-source ERP systems can generate measurable efficiency gains and strengthen digital governance in developing-country public administrations an area where empirical evidence remains limited.

Conclusion:

The findings of this study demonstrate that the adoption of the open-source ERP system Odoo constitutes a significant lever for the modernization of Human Resource Management (HRM) within Algerian public institutions. By replacing fragmented, paper-based administrative routines with integrated digital workflows, Odoo contributes directly to improvements in efficiency, data accuracy, and procedural transparency. The combination of empirical screenshots, conceptual modelling, and quantitative performance indicators confirms that digital HRM—when supported by a customizable and low-cost ERP platform—can effectively address chronic challenges such as delayed recruitment cycles, inconsistent personnel files, and limited real-time monitoring capacities.

Beyond operational benefits, the study highlights deeper socio-technical transformations**.** Odoo's modular design supports the reengineering of HR processes, fosters greater managerial accountability, and enables more informed decision-making through structured data. These outcomes align with international digital-governance frameworks and provide a strong empirical foundation for expanding open-source ERP adoption across the public sector in Algeria.

Overall, the research affirms that Odoo is not merely a technological tool but a catalyst for organizational change. Its adoption strengthens institutional performance, contributes to public-sector digital maturity, and supports national strategies for administrative modernization. Future research should expand the comparative scope of this work by examining multi-institution deployments,

interoperability challenges, and the integration of advanced capabilities such as HR analytics and AI-assisted decision systems.

This study has several limitations: it relies on a single case, which restricts generalizability; it lacks longitudinal performance data to assess long-term outcomes; and it focuses solely on HRM functions, excluding other potentially relevant ERP modules.

Future research should compare multiple public institutions, conduct quantitative long-term performance assessments, explore the integration of AI-driven HR analytics within Odoo, and examine cybersecurity and data protection challenges associated with open-source ERP adoption.

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