Research Article

Intelligent systems for project management in public institutions: a review of the state of the art in Scopus

1stCarlos Augusto Valera-Mendoza 1*

¹Escuela de Posgrado, Universidad César Vallejo, Tarapoto, Perú

*Corresponding Author:cavaleram1@ucvvirtual.edu.pe

ARTICLE INFO	ABSTRACT
	The study analyzed the use of intelligent systems in project management within public institutions, focusing on applied technologies, implementation challenges, and emerging trends. Through a systematic review of 29 scientific articles indexed in Scopus (2013-2024), technologies such as Artificial Intelligence (AI), Big Data, ERP, and Blockchainwere identified, highlighting their impact on the efficiency and transparency of projects. The results show that these technologies have optimized resource allocation and improved decision-making, while the modernization of legacy systems has facilitated the digitalization of public services. Additionally, increased efficiency in managing international projects has been observed through collaborative cloud platforms. However, challenges related to system interoperability, data security, and the need for staff training persist. The success of implementing these technologies depends on a strong governance framework and the institutions' ability to adapt to technological advances. In conclusion, intelligent systems present a significant opportunity to enhance project management in the public sector, although addressing these challenges is essential to maximize their impact. **Keywords:**Automated Systems, Government Organizations, Project Control, Project Planning, Public Sector

INTRODUCTION

The development of cloud-based collaborative platforms has revolutionized the way projects are managed within institutions, including those in the public sector (Al-Sharafi et al., 2023). These platforms offer solutions that allow organizations to manage resources, coordinate activities, and optimize real-time communication among involved parties (Kraus et al., 2021). In the context of international technical cooperation, where multiple actors such as local governments and international organizations interact, cloud technology has facilitated greater efficiency in project execution and control (Ahi et al., 2022).

Cloud platforms enable the integration of data from various sources and centralize them into a unified system, which not only optimizes activity tracking but also improves strategic decision-making by providing a clearer and more detailed view of relevant information (Han & Zhang, 2024). This capacity for centralization and immediate access to information is especially useful in international technical cooperation, where the complexity of interactions among actors at different levels requires precise coordination and smooth communication (Hung et al., 2023).

Moreover, these platforms have allowed the automation of key processes in project management, reducing administrative burdens and enabling teams to focus on more strategic aspects (Coombs et al., 2020; Salas-Tanchiva, 2022). The ability to collaborate in real-time, despite geographical distances, is one of the main benefits, as it facilitates continuous interaction and monitoring in cooperation projects, often involving multiple countries and regions (Taboada et al., 2023).

However, the implementation of cloud-based collaborative platforms also presents a series of challenges that need to be addressed. One of the main issues is ensuring data security, as these platforms handle sensitive information that must be protected from unauthorized access (Soveizi et al., 2023). Additionally, system interoperability between different institutions is another significant challenge, as each organization may use different technologies that are not always compatible (Malik et al., 2024).

For local governments, adopting cloud-based solutions requires adapting existing technological infrastructures, which can pose a considerable barrier in terms of costs and staff training (David et al., 2023). Often, these governments lack the necessary resources to invest in advanced technology, making full implementation of these platforms difficult (Chen et al., 2023). Furthermore, limited connectivity in some rural areas represents an additional obstacle, affecting the effectiveness of international technical cooperation (Ali et al., 2020).

Despite these challenges, cloud-based collaborative platforms continue to prove valuable tools for project management in international cooperation contexts (Marnewick&Marnewick, 2022). The experiences of different local governments that have implemented these platforms suggest that, with proper planning and a focus on staff training, these technological solutions can significantly improve the efficiency and sustainability of long-term projects (Martínez-Peláez et al., 2023; Nadkarni&Prügl, 2021).

The objective of this research was to conduct a systematic review of the scientific literature on the use of intelligent systems for project management in public institutions indexed in Scopus. Through this analysis, the aim was to identify the main technological trends, the challenges in their implementation, and the gaps in the current literature, providing a solid foundation for future research and the development of best practices in project management.

METHODOLOGY

Research Characterization

In this study, a systematic review of the scientific literature was conducted to evaluate and analyze research on the use of intelligent systems in project management within public institutions. A quantitative and descriptive approach was employed, based on the scientific output, identifying key articles and metrics. The objective was to quantify and characterize the available research from the data collected in the Scopus database, providing an accurate assessment of technological trends and the main challenges associated with this field.

Search Procedures

This study followed the protocol proposed by Cronin et al. (2008), which includes the following steps: (1) formulation of the research question; (2) establishment of inclusion and exclusion criteria; (3) identification of relevant articles; (4) evaluation of the quality and relevance of the selected literature; and (5) analysis and synthesis of results. For inclusion and exclusion criteria, the search was limited to materials published between January 2013 and July 2024, restricted to articles in English to ensure an international perspective. The search was conducted in a single phase, ensuring an exhaustive review by strictly applying these criteria.

Scopus Search Phase

During the search phase, the following search term was used: ("intelligent systems" OR "smart systems" OR "automated systems" OR "cognitive systems") AND ("project management" OR "project planning" OR "project control" OR "project coordination") AND ("public institutions" OR "government organizations" OR "public sector" OR "state agencies") to identify articles related to the use of intelligent systems in project management within public institutions. Specific keywords included both the technical aspects of intelligent systems and their application in project planning and control in the public sector. This search resulted in the identification of 984 documents, providing a solid basis for further analysis of trends and challenges in this field.

Subsequently, in addition to the keywords, inclusion and exclusion filters were applied to refine the results. Only journal articles (LIMIT-TO(SRCTYPE, "j")) written in English (LIMIT-TO(LANGUAGE, "English")) were included. All articles were considered regardless of their open-access status (LIMIT-TO(OA, "all")). The search was limited to articles published between 2013 and 2024 (PUBYEAR > 2012 AND PUBYEAR < 2025) within the subject area of computer science (LIMIT-TO(SUBJAREA, "COMP")), which were in their final publication stage and classified as research articles (LIMIT-TO(DOCTYPE, "ar")). This strategy resulted in the identification of 117 documents, which form the basis for the analysis in this study.

Despite applying specific search terms to restrict the results to the use of intelligent systems in project management within public institutions, the initial searches yielded a significant number of unrelated works. After

reviewing the titles and abstracts, 29 articles were selected to be part of the final review analysis. Figure 1 summarizes the methodological process of selecting scientific articles related to the use of intelligent systems in project management within the public sector.

Figure 1. Article selection process
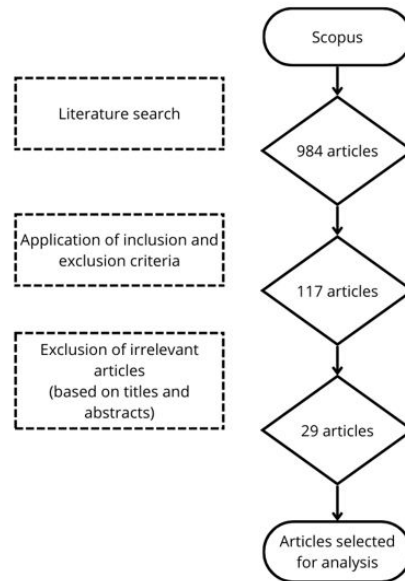
Of the total number of articles selected, a comprehensive analysis was conducted following five key stages. First, the most relevant background information was reviewed to establish a solid foundation of previous research on the use of intelligent systems in project management in public institutions. Second, the objectives or research questions of each study were identified, highlighting the main focus of each work. Third, the theoretical foundations were analyzed, paying special attention to the conceptual frameworks and theories used to support the research. Fourth, the methods used were evaluated, including the procedures, technologies and tools applied for data collection and analysis. Finally, the key results were examined, highlighting the main findings that responded to the research objectives set out in each study. This process allowed obtaining a comprehensive and technical overview of the state of the art in project management using intelligent systems in the public sector.

RESULTSAND DISCUSSION

Table 1 shows the articles selected for analysis, assigning a unique code to each one in order to simplify their reference. In addition, information is provided on the authors, the year of publication, the title of each study and the journal in which it was published. This organization facilitates a quick and efficient consultation of the studies used in this research.

Table 1. Selected articles from Scopus databases

Code	Autors	Title	Journal
A1	(Alshehhi et al., 2024)	Procurement of Artificial Intelligence Systems in UAE Public Sectors: An Interpretive Structural Modeling of Critical Success Factors	Sustainability (Switzerland)
A2	(Akbar et al., 2024)	Trustworthy artificial intelligence: A decision-making taxonomy of potential challenges	Software - Practice and Experience
A3	(Ciancarini et al., 2024)	Scrum@PA: Tailoring an Agile Methodology to the Digital Transformation in the Public Sector	Information (Switzerland)
A4	(Kusumawardhana et al., 2024)	Identifying Critical Success Factors (CSF) in ERP Implementation Using AHP: A Case Study of a Social Insurance Company in Indonesia	Journal of Cases on Information Technology
A5	(Owolabi et al., 2024)	Big data innovation and implementation in projects teams: towards a SEM approach to conflict prevention	Information Technology and People
A6	(Gładysz et al., 2024)	Application of data envelopment analysis to IT project evaluation, with special emphasis on the choice of inputs and outputs in the context of the	Journal of Information and Telecommunicatio

		organization in question	n
A7	(Müller et al., 2024)	Adopting information systems at work: a longitudinal examination of trust dynamics, antecedents, and outcomes	Behaviour and Information Technology
A8	(Guerrero-Avendaño et al., 2023)	Governance and Corporate Management System Supported by Innovation, Technology, and Digital Transformation as a Driver of Change	Sustainability (Switzerland)
A9	(Zahid et al., 2023)	Secure Data Management Life Cycle for Government Big-Data Ecosystem: Design and Development Perspective	Systems
A10	(Hasib et al., 2023)	Risk Mitigation and Monitoring Challenges in Software Organizations: A Morphological Analysis	International Journal on Recent and Innovation Trends in Computing and Communication
A11	(Uren & Edwards, 2023)	Technology readiness and the organizational journey towards AI adoption: An empirical study	International Journal of Information Management
A12	(Yaghubi et al., 2023)	Development of a Financing Optimization Framework Based on Risk Simulation in BOT Projects: A Case Study of the Waste-to-Energy Project	Complexity
A13	(Zare Khafri et al., 2023)	The Effect of Innovation on the Company's Performance in Small and Medium-Sized Businesses with the Mediating Role of Lean: Agile Project Management Office (LAPMO)	Complexity
A14	(Zhao & Jensen, 2022)	Towards a Modern Learning Organization: Human-Centered Digitalization of Lessons Learned Management for Complex Systems Development Projects	Technologies
A15	(Romero Izurieta et al., 2022)	Model to Optimize the Management of Strategic Projects Using Genetic Algorithms in a Public Organization	Information (Switzerland)
A16	(Abu Bakar et al., 2022)	A Qualitative Study of Legacy Systems Modernisation for Citizen-Centric Digital Government	Sustainability (Switzerland)
A17	(Van Veldhoven & Vanthienen, 2022)	Digital transformation as an interaction-driven perspective between business, society, and technology	Electronic Markets
A18	(Khalfan et al., 2022)	Blockchain Technology: Potential Applications for Public Sector E-Procurement and Project Management	Sustainability (Switzerland)
A19	(Mandičák et al., 2021)	Supply chain management and big data concept effects on economic sustainability of building design and project planning	Applied Sciences (Switzerland)
A20	(Demirdöğen et al., 2021)	Lean based maturity framework integrating value, BIM and big data analytics: Evidence from AEC industry	Sustainability (Switzerland)
A21	(Faccia & Petratos, 2021)	Blockchain, enterprise resource planning (ERP) and accounting information systems (AIS): Research on e-procurement and system integration	Applied Sciences (Switzerland)
A22	(Zaleski & Michalski, 2021)	Success factors in sustainable management of it service projects: Exploratory factor analysis	Sustainability (Switzerland)

A23	(Alulema & Llorens, 2021)	Alignment of the portfolio of it projects with the it governance in spanish universities	TECHNO Review. International Technology, Science and Society Review
A24	(Mukred et al., 2021)	Improving the decision-making process in the higher learning institutions via electronic records management system adoption	KSII Transactions on Internet and Information Systems
A25	(Hassan & Asghar, 2021)	A framework of software project scope definition elements: An ism-dematel approach	IEEE Access
A26	(Thomas & Alkhafaji, 2020)	Business intelligence tools and team performance of oil and gas industries	Journal of Advanced Research in Dynamical and Control Systems
A27	(Lugonja, 2018)	ERP implementation and interoperability growth as organization improvement agents in public administration further development	Journal of Information and Organizational Sciences
A28	(Amali & Katili, 2018)	Identification of influential factors in implementing it governance: A survey study of Indonesian companies in the public sector	Interdisciplinary Journal of Information, Knowledge, and Management
A29	(Arikan et al., 2013)	A Fuzzy Multi-Attribute Decision Making Model for Strategic Risk Assessment	International Journal of Computational Intelligence Systems

Analysis of the main topics

Table 2 presents the topics addressed in the selected research, classified into five categories: intelligent systems for project management, implementation of ERP and management systems, digital transformation, data analysis and decision making, and evaluation of emerging technologies. Of the articles studied, 12 (A1, A3, A4, A6, A8, A11, A12, A16, A18, A19, A20, A23) focus on intelligent systems for project management; 9 (A5, A7, A10, A13, A15, A17, A21, A24, A27) analyze the implementation of ERP and management systems; 7 (A2, A9, A14, A16, A22, A26, A28) deal with digital transformation; 6 (A3, A6, A9, A12, A18, A25) focus on data analysis and decision making; and 4 (A4, A10, A19, A29) address the assessment of emerging technologies.

Table 2. Topics addressed in the research analyzed.

Analysis elements	Frequency (Percentage)	Articles
Intelligent systems for project management	12 (41.3%)	A1, A3, A4, A6, A8, A11, A12, A16, A18, A19, A20, A23
ERP and management systems implementation	9 (31.0%)	A5, A7, A10, A13, A15, A17, A21, A24, A27
Digital transformation	7 (24.1%)	A2, A9, A14, A16, A22, A26, A28
Data analysis and decision making	6 (20.6%)	A3, A6, A9, A12, A18, A25
Evaluation of emerging technologies	4 (13.7%)	A4, A10, A19, A29

Analysis of the main background

Table 3 presents the key motivations and knowledge gaps that drove the selected research. One of the main

motivations was the need to improve efficiency in project management within public institutions, identifying a lack of intelligent systems that optimize decision-making and resource allocation. Another important gap was the limited implementation of ERP systems and management tools in the public sector, which led several studies to explore their potential to improve organizational productivity. Digital transformation, driven by the need to modernize obsolete administrative processes, was another determining factor. Additionally, a lack of robust data analysis and predictive models in project management was detected, which motivated studies on how emerging technologies can offer better solutions to these challenges. Finally, the evaluation of emerging technologies such as artificial intelligence and blockchainwas driven by the need to overcome limitations in security and transparency in public processes.

Table 3. Analysis of the main background.

Analysis elements	Frequency (Percentage)	Articles
Need for intelligent systems to improve project management	12 (41.3%)	A1, A3, A4, A6, A8, A11, A12, A16, A18, A19, A20, A23
Insufficient implementation of ERP and management systems in the public sector	9 (31.0%)	A5, A7, A10, A13, A15, A17, A21, A24, A27
Lack of digital modernization in administrative processes	7 (24.1%)	A2, A9, A14, A16, A22, A26, A28
Absence of advanced data analysis and predictive models	6 (20.6%)	A3, A6, A9, A12, A18, A25
Need to evaluate emerging technologies to overcome limitations in security and transparency	4 (13.7%)	A4, A10, A19, A29

Technological Component Analysis

Table 4 reveals a wide variety of technologies applied in the studies, both in general and specific terms. Technologies such as Artificial Intelligence (AI), Big Data, ERP, and Blockchainare repeatedly mentioned, reflecting their growing adoption across various industries and organizational contexts. For example, AI is used for decision-making and trust evaluation (A2, A1), while Big Data appears in innovation and data management (A5, A9). Other technologies, such as ERP and genetic algorithms, are applied in the optimization and management of strategic projects (A4, A15).

The inferences show that the research is focused on improving organizational efficiency through the use of advanced technologies. A trend toward the digitalization and automation of processes is observed, as in the cases of legacy system modernization (A16) and knowledge management (A14). Additionally, the focus on predictive models and algorithms highlights the importance of data-driven optimization, suggesting a future increasingly dominated by intelligent technologies that seek to solve complex problems and improve efficiency in key sectors such as public management, construction, and education.

Table 4. Classification of documents according to the technological component

Articles	Applied technologies (general)	Applied technologies (specific)
A1	Artificial Intelligence (AI) Interpretive Structural Modeling (ISM)	Artificial Intelligence (AI) Interpretive Structural Modeling (ISM)
A2	Artificial Intelligence (AI) Taxonomy of Challenges in AI Trust	Artificial Intelligence (AI) Taxonomy of Challenges in AI Trust
A3	Agile Development Scrum, iAgile	Agile Development Scrum, iAgile
A4	ERP, Project Management Analytic Hierarchy Process (AHP)	ERP, Project Management Analytic Hierarchy Process (AHP)
A5	Big Data SEM (Structural Equation Modeling)	Big Data SEM (Structural Equation Modeling)
A6	Data Envelopment Analysis (DEA) DEA applied	Data Envelopment Analysis (DEA)

	to Project Evaluation	DEA applied to Project Evaluation
A7	Information Systems Latent Growth Curve Modeling	Information Systems Latent Growth Curve Modeling
A8	Digital Transformation Corporate Management System	Digital Transformation Corporate Management System
A9	Big Data Data Management Life Cycle, AES 128	Big Data Data Management Life Cycle, AES 128
A10	Project Management Morphological Analysis	Project Management Morphological Analysis
A11	Artificial Intelligence (AI) Maturity Models for AI	Artificial Intelligence (AI) Maturity Models for AI
A12	Risk Simulation Genetic Algorithms, Monte Carlo	Risk Simulation Genetic Algorithms, Monte Carlo
A13	Agile Management Lean-Agile Project Management Office (LAPMO)	Agile Management Lean-Agile Project Management Office (LAPMO)
A14	Digitalization of Learning Knowledge Management	Digitalization of Learning Knowledge Management
A15	Genetic Algorithms Mathematical Model of Projects Strategic	Genetic Algorithms Mathematical Model of Projects Strategic
A16	Systems Modernization Legacy Systems	Systems Modernization Legacy Systems
A17	Digital Transformation Digital Interaction Framework	Digital Transformation Digital Interaction Framework
A18	Blockchain, E-Procurement Oracle Blockchain Cloud	Blockchain, E-Procurement Oracle Blockchain Cloud
A19	Big Data, SCM Supply Chain Management	Big Data, SCM Supply Chain Management
A20	Lean Management Building Information Modelling (BIM)	Lean Management Building Information Modelling (BIM)
A21	Blockchain, ERP, AIS Blockchain Integration with ERP and AIS	Blockchain, ERP, AIS Blockchain Integration with ERP and AIS
A22	IT Service Management Agile Techniques, Exploratory Factor Analysis	IT Service Management Agile Techniques, Exploratory Factor Analysis
A23	IT Governance Project Portfolio Evaluation	IT Governance Project Portfolio Evaluation
A24	Electronic Records Management ERMS (Electronic Records Management System)	Electronic Records Management ERMS (Electronic Records Management System)
A25	Software Project Management ISM-DEMATEL	Software Project Management ISM-DEMATEL
A26	Business Intelligence (BI) BI Tools in Oil Industries	Business Intelligence (BI) BI Tools in Oil Industries
A27	ERP Interoperability in Public Administration	ERP Interoperability in Public Administration
A28	IT Governance SEM Surveys and Models	IT Governance SEM Surveys and Models
A29	Multi-attribute Decision Making AHP and Fuzzy Logarithmic Least Squares	Multi-attribute Decision Making AHP and Fuzzy Logarithmic Least Squares

Theoretical Elements Analysis

Table 5 highlights the fundamental theoretical aspects that support the technological approaches applied in the studies, covering a wide range of classical and contemporary theories on management, technology adoption, and process optimization. For example, the Productive Efficiency Theory applied in study A6 with DEA is used to analyze the efficiency of IT projects, while the Trust in AI Theory (A2) focuses on the ethical and reliability challenges faced in the adoption of AI technologies in critical processes. Similarly, the Digital Transformation Theory and the Theory of Interaction between Business, Society, and Technology (A17) provide a robust framework for understanding the impact that digitalization has on organizations and their environment.

Collectively, these studies reflect a multidisciplinary approach in which traditional theories such as AHP and Lean Management (A4, A20) are combined with more recent approaches like Blockchain (A18) and Big Data

Management (A9). This suggests a growing trend toward the convergence of management, sustainability, and technology theories, aiming to find innovative solutions to improve organizational and technological efficiency. The adoption and adaptation of these theories in specific contexts underscore the importance of integrating solid theoretical principles with practical approaches that can be applied across various sectors..

Table 5. Classification of articles according to research topics

Articles	Theoretical Aspects (General)	Theoretical Aspects (Specific)
A1	Interpretive Structural Modeling (ISM) Critical Success Factors (CSF) Theory	Interpretive Structural Modeling (ISM) Critical Success Factors (CSF) Theory
A2	Trust in AI Trust Theory, Multivocal Literature Review (MLR)	Trust in AI Trust Theory, Multivocal Literature Review (MLR)
A3	Agile Development Agile Project Management Theory	Agile Development Agile Project Management Theory
A4	Decision Hierarchy and Analysis Analytic Hierarchy Process (AHP)	Decision Hierarchy and Analysis Analytic Hierarchy Process (AHP)
A5	Conflict and Team Management Conflict Theory, Power Relationships and Conflict Prevention	Conflict and Team Management Conflict Theory, Power Relationships and Conflict Prevention
A6	Efficiency Analysis Productive Efficiency Theory, DEA (Data Envelopment Analysis)	Efficiency Analysis Productive Efficiency Theory, DEA (Data Envelopment Analysis)
A7	Growth Curve Modeling Technology Adoption Theory, Latent Growth Models	Growth Curve Modeling Technology Adoption Theory, Latent Growth Models
A8	Corporate Management and Governance Digital Transformation Theory, KPI and KRP	Corporate Management and Governance Digital Transformation Theory, KPI and KRP
A9	Data Lifecycle and Security Data Management Theory, Cryptography (AES 128)	Data Lifecycle and Security Data Management Theory, Cryptography (AES 128)
A10	Project Management and Risk Mitigation Morphological Theory, Risk Mitigation in Projects	Project Management and Risk Mitigation Morphological Theory, Risk Mitigation in Projects
A11	AI Adoption Technology Readiness Levels Theory	AI Adoption Technology Readiness Levels Theory
A12	Risk Simulation Monte Carlo Simulation Theory and Genetic Algorithms	Risk Simulation Monte Carlo Simulation Theory and Genetic Algorithms
A13	Organizational Innovation Lean-Agile Theory, Innovation Management in SMEs	Organizational Innovation Lean-Agile Theory, Innovation Management in SMEs
A14	Digitalization of Knowledge Organizational Learning Theory, Systems Thinking	Digitalization of Knowledge Organizational Learning Theory, Systems Thinking
A15	Strategic Project Optimization Optimization Theory, Genetic Algorithms	Strategic Project Optimization Optimization Theory, Genetic Algorithms
A16	Legacy Systems Modernization Systems Modernization Theory, Digital Transformation	Legacy Systems Modernization Systems Modernization Theory, Digital Transformation
A17	Digital Transformation Theory of the Interaction between Business, Society and Technology	Digital Transformation Theory of the Interaction between Business, Society and Technology
A18	Blockchain in Project Management Blockchain and Smart Contracts Theory	Blockchain in Project Management Blockchain and Smart Contracts Theory
A19	Supply Chain Management and Big Data Supply Chain Management Theory (SCM)	Supply Chain Management and Big Data Supply Chain Management Theory (SCM)
A20	Lean Management and BIM Lean Theory, Building Information Modeling (BIM)	Lean Management and BIM Lean Theory, Building Information Modeling (BIM)

A21	ERP and Blockchain Theory of Integration Blockchain and ERP/AIS	ERP and Blockchain Theory of Integration Blockchain and ERP/AIS
A22	Sustainable IT Project Management Theory of Sustainability in IT Projects, Agile Methods	Sustainable IT Project Management Theory of Sustainability in IT Projects, Agile Methods
A23	IT Governance Theory of IT Governance (ISO/IEC 38500)	IT Governance Theory of IT Governance (ISO/IEC 38500)
A24	Electronic Records Management UTAUT Theory, TOE (Technology, Organization, Environment)	Electronic Records Management UTAUT Theory, TOE (Technology, Organization, Environment)
A25	Scope Definition in Software Projects Interpretive Modeling (ISM) and DEMATEL	Scope Definition in Software Projects Interpretive Modeling (ISM) and DEMATEL
A26	Business Intelligence (BI) Theory of Business Intelligence and Team Performance	Business Intelligence (BI) Theory of Business Intelligence and Team Performance
A27	ERP in Public Administration Theory of Interoperability and Public Management	ERP in Public Administration Theory of Interoperability and Public Management
A28	IT Governance in the Public Sector Governance Theory, SEM Models	IT Governance in the Public Sector Governance Theory, SEM Models
A29	Multi-Attribute Decision Making Multi-Attribute Decision Theory, AHP and Fuzzy Logarithmic	Multi-Attribute Decision Making Multi-Attribute Decision Theory, AHP and Fuzzy Logarithmic

Analysis of Results

Table 6 shows the results achieved by the reviewed studies, marking a clear trend towards the optimization of technological and organizational processes, with a strong focus on the implementation and adoption of advanced technologies such as Artificial Intelligence (AI), Big Data, and Blockchain. A recurring pattern in many studies is the improvement in operational efficiency and decision-making, as evident in research that applies advanced mathematical models and algorithms to improve the management of strategic projects (A15) or the modernization of legacy systems (A16). These improvements not only optimize the use of resources, but are also expected to increase productivity in different sectors, such as construction (A19) and public administration (A27).

Another important aspect is the digital transformation in organizations, which is not only limited to the implementation of new technologies, but also encompasses profound cultural and organizational changes. Studies examining digitalisation and technological governance, such as in the case of IT management in universities (A23) or the modernisation of public systems (A16), highlight that the successful adoption of these technologies depends on a solid governance framework and the alignment of technological strategies with organisational objectives. This expected impact not only translates into greater efficiency, but also into the creation of a more transparent and user-centred environment.

Table 6. Results obtained from the articles analyzed

Articles	Results Achieved	Expected Impact
A1	Improved identification of critical success factors (CSFs) in AI procurement Increased effectiveness in the procurement of AI systems in the public sector	Improved identification of critical success factors (CSFs) in AI procurement Increased effectiveness in the procurement of AI systems in the public sector
A2	Development of a taxonomy of challenges in trust in AI Improved ethical decision making related to AI	Development of a taxonomy of challenges in trust in AI Improved ethical decision making related to AI
A3	Adapting Scrum to the public sector Optimizing the delivery of public digital services	Adapting Scrum to the public sector Optimizing the delivery of public digital services
A4	Identification of critical factors in ERP implementation Reduction of failures in ERP projects in the public sector	Identification of critical factors in ERP implementation Reduction of failures in ERP projects in the public sector
A5	Proposal of a SEM model to prevent conflicts in Big Data implementation Improved cohesion of technology project	Proposal of a SEM model to prevent conflicts in Big Data implementation Improved cohesion of technology

	teams	project teams
A6	Identification of inefficiencies in IT projects using DEA Improved resource allocation in technology projects	Identification of inefficiencies in IT projects using DEA Improved resource allocation in technology projects
A7	Growth of trust in information systems over time Increased adoption and successful use of new technologies	Growth of trust in information systems over time Increased adoption and successful use of new technologies
A8	Design of a corporate management system based on digital transformation Better alignment of corporate strategy with technology	Design of a corporate management system based on digital transformation Better alignment of corporate strategy with technology
A9	Proposal of a secure lifecycle for the government big data ecosystem Better management and protection of large volumes of government data	Proposal of a secure lifecycle for the government big data ecosystem Better management and protection of large volumes of government data
A10	Development of a Morphological analysis framework for risk mitigation Risk reduction in software projects	Development of a Morphological analysis framework for risk mitigation Risk reduction in software projects
A11	Identification of technological maturity levels for AI Accelerating AI adoption in innovative organizations	Identification of technological maturity levels for AI Accelerating AI adoption in innovative organizations
A12	Optimizing financing in BOT projects using Monte Carlo simulation Reducing cost and time in infrastructure projects	Optimizing financing in BOT projects using Monte Carlo simulation Reducing cost and time in infrastructure projects
A13	Demonstrating the relationship between innovation and SME performance using LAPMO Improving innovation and performance in small and medium-sized companies	Demonstrating the relationship between innovation and SME performance using LAPMO Improving innovation and performance in small and medium-sized companies
A14	Human-centered digitalization proposal for lessons learned management Improving organizational knowledge management	Human-centered digitalization proposal for lessons learned management Improving organizational knowledge management
A15	Optimizing strategic project management using genetic algorithms Increasing the efficiency of public strategic projects	Optimizing strategic project management using genetic algorithms Increasing the efficiency of public strategic projects
A16	Identifying barriers and facilitators for the modernization of legacy systems Improving the digitalization of public services	Identifying barriers and facilitators for the modernization of legacy systems Improving the digitalization of public services
A17	Developing a framework for interaction between digital transformation, society and technology Better understanding of the drivers of digital transformation	Developing a framework for interaction between digital transformation, society and technology Better understanding of the drivers of digital transformation
A18	Identifying Blockchain applications for public procurement Greater transparency and efficiency in public procurement	Identifying Blockchain applications for public procurement Greater transparency and efficiency in public procurement
A19	Impact of Big Data and SCM on the economic sustainability of construction projects Cost reduction and	Impact of Big Data and SCM on the economic sustainability of construction projects Cost reduction and
A20	Proposal for a maturity framework based on Lean and BIM Increased productivity in the construction industry	Proposal for a maturity framework based on Lean and BIM Increased productivity in the construction industry

A21	Proposal for the integration of Blockchain with ERP and AIS Improved security and efficiency of ERP systems	Proposal for the integration of Blockchain with ERP and AIS Improved security and efficiency of ERP systems
A22	Identification of success factors in sustainable IT project management Improved sustainability of IT projects	Identification of success factors in sustainable IT project management Improved sustainability of IT projects
A23	Evaluation of the alignment of IT project portfolios with university governance Improved governance and effectiveness of university projects	Evaluation of the alignment of IT project portfolios with university governance Improved governance and effectiveness of university projects
A24	Identification of factors influencing the adoption of ERMS in universities Increased efficiency and decision making in educational institutions	Identification of factors influencing the adoption of ERMS in universities Increased efficiency and decision making in educational institutions
A25	Development of an ISM-DEMATEL framework to define the scope of software projects Reduction of delays and cost overruns in software projects	Development of an ISM-DEMATEL framework to define the scope of software projects Reduction of delays and cost overruns in software projects
A26	Identification of the impact of BI tools on team performance Improved organizational performance through the use of BI	Identification of the impact of BI tools on team performance Improved organizational performance through the use of BI
A27	Proposal for interoperability in ERP implementation in public administration Greater integration and efficiency in public administration	Proposal for interoperability in ERP implementation in public administration Greater integration and efficiency in public administration
A28	Identification of influencing factors in IT governance in Indonesia Improved technological governance in the Public sector	Identification of influencing factors in IT governance in Indonesia Improved technological governance in the Public sector
A29	Development of a multi-attribute model for strategic risk decision making Improvement in the prioritization and management of strategic risks	Development of a multi-attribute model for strategic risk decision making Improvement in the prioritization and management of strategic risks

The results of the studies provide specific solutions to well-identified problems in key areas such as project management, digital transformation, IT governance, and technological innovation. For example, research on Blockchain in public procurement (A18) reveals a significant impact on transparency and efficiency in contract management, which could significantly reduce corruption and costs in public sector procurement. Similarly, the use of Lean and BIM in construction (A20) shows how the integration of management philosophies and advanced technology can increase productivity in traditionally inefficient industries.

The studies point to a change in the way organizations approach the implementation of emerging technologies. The expected impacts include not only operational improvements, but also profound transformations in organizational culture and in the way companies and governments interact with digital technologies. This suggests that as these technologies and approaches are implemented, there will be a shift towards more agile, transparent and innovation-oriented structures.

CONCLUSION

The analysis carried out in this study demonstrates the growing importance of intelligent systems for project management in public institutions, highlighting their impact on operational efficiency and resource optimization. The results reveal that technologies such as Artificial Intelligence, Big Data, and ERP systems offer advanced solutions to improve decision-making and strategic planning in public sector projects. Through the implementation of these tools, the integration of processes is facilitated, allowing greater agility in resource management and the reduction of errors associated with manual decision-making. However, important challenges were identified, such as interoperability between systems and data security, which must be addressed to ensure effective adoption of these technologies.

In terms of impact, the application of emerging technologies in project management is expected to not only boost efficiency within public institutions, but also promote greater transparency and accountability in project execution. The modernization of legacy systems and the integration of new collaborative platforms allow for better information management and greater participation of the actors involved in the projects. This study also highlights the need for training and organizational adaptation to maximize the potential of these technologies, ensuring that institutions are prepared to face the challenges of digitalization.

ETHICAL DECLARATION

Conflict of interest: No declaration required. **Financing:** No reporting required. **Peer review:** Double anonymous peer review.

REFERENCES

Abu Bakar, H., Razali, R., &Jambari, D. I. (2022). A Qualitative Study of Legacy Systems Modernisation for Citizen-Centric Digital Government. Sustainability (Switzerland), 14(17). https://doi.org/10.3390/su141710951

Ahi, A. A., Sinkovics, N., Shildibekov, Y., Sinkovics, R. R., &Mehandjiev, N. (2022). Advanced technologies and international business: A multidisciplinary analysis of the literature. International Business Review, 31(4), 101967. https://doi.org/10.1016/j.ibusrev.2021.101967

Akbar, M. A., Khan, A. A., Mahmood, S., Rafi, S., & Demi, S. (2024). Trustworthy artificial intelligence: A decision-making taxonomy of potential challenges. Software - Practice and Experience, 54(9), 1621–1650. https://doi.org/10.1002/spe.3216

Al-Sharafi, M. A., Iranmanesh, M., Al-Emran, M., Alzahrani, A. I., Herzallah, F., & Jamil, N. (2023). Determinants of cloud computing integration and its impact on sustainable performance in SMEs: An empirical investigation using the SEM-ANN approach. Heliyon, 9(5), e16299. https://doi.org/10.1016/j.heliyon.2023.e16299

Ali, O., Shrestha, A., Osmanaj, V., & Muhammed, S. (2020). Cloud computing technology adoption: an evaluation of key factors in local governments. Information Technology & People, 34(2), 666–703. https://doi.org/10.1108/ITP-03-2019-0119

Alshehhi, K., Cheaitou, A., & Rashid, H. (2024). Procurement of Artificial Intelligence Systems in UAE Public Sectors: An Interpretive Structural Modeling of Critical Success Factors. Sustainability (Switzerland), 16(17). https://doi.org/10.3390/su16177724

Alulema, F. X. V., &Llorens, F. (2021). Alignment of the portfolio of it projects with the it governance in spanish universities. TECHNO Review. International Technology, Science and Society Review / RevistaInternacional de Tecnología, Ciencia y Sociedad, 10(2), 111–131. https://doi.org/10.37467/gka-revtechno.v10.2813

Amali, L. N., & Katili, M. R. (2018). Identification of influential factors in implementing it governance: A survey study of Indonesian companies in the public sector. Interdisciplinary Journal of Information, Knowledge, and Management, 13, 61–77. https://doi.org/10.28945/3975

Arikan, R., Dağdeviren, M., & Kurt, M. (2013). A Fuzzy Multi-Attribute Decision Making Model for Strategic Risk Assessment. International Journal of Computational Intelligence Systems, 6(3), 487–502. https://doi.org/10.1080/18756891.2013.781334

Chen, M., Wang, H., Liang, Y., & Zhang, G. (2023). Net and configurational effects of determinants on cloud computing adoption by SMEs under cloud promotion policy using PLS-SEM and fsQCA. Journal of Innovation & Knowledge, 8(3), 100388. https://doi.org/10.1016/j.jik.2023.100388

Ciancarini, P., Giancarlo, R., &Grimaudo, G. (2024). Scrum@PA: Tailoring an Agile Methodology to the Digital Transformation in the Public Sector. Information (Switzerland), 15(2). https://doi.org/10.3390/info15020110

Coombs, C., Hislop, D., Taneva, S. K., & Barnard, S. (2020). The strategic impacts of Intelligent Automation for knowledge and service work: An interdisciplinary review. The Journal of Strategic Information Systems, 29(4), 101600. https://doi.org/10.1016/j.jsis.2020.101600

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: a step-by-step approach. British Journal of Nursing, 17(1), 38–43. https://doi.org/10.12968/bjon.2008.17.1.28059

David, A., Yigitcanlar, T., Li, R. Y. M., Corchado, J. M., Cheong, P. H., Mossberger, K., &Mehmood, R. (2023). Understanding Local Government Digital Technology Adoption Strategies: A PRISMA Review. Sustainability, 15(12), 9645. https://doi.org/10.3390/su15129645

Demirdöğen, G., Diren, N. S., Aladağ, H., &Işık, Z. (2021). Lean based maturity framework integrating value, BIM and big data analytics: Evidence from AEC industry. Sustainability (Switzerland), 13(18). https://doi.org/10.3390/su131810029

Faccia, A., &Petratos, P. (2021). Blockchain, enterprise resource planning (ERP) and accounting information systems (AIS): Research on e-procurement and system integration. Applied Sciences (Switzerland), 11(15). https://doi.org/10.3390/app11156792

Gładysz, B., Despotis, D., &Kuchta, D. (2024). Application of data envelopment analysis to IT project evaluation, with special emphasis on the choice of inputs and outputs in the context of the organization in question. Journal of Information and Telecommunication, 8(3), 301–314. https://doi.org/10.1080/24751839.2023.2286764

Guerrero-Avendaño, A., Nieto Bernal, W., & Luna Amaya, C. (2023). Governance and Corporate Management System Supported by Innovation, Technology, and Digital Transformation as a Driver of Change. Sustainability (Switzerland), 15(17). https://doi.org/10.3390/su151713150

Han, F., & Zhang, D. (2024). Government digitalization and its influence on government functions transformation adopting a Structural Functionalism perspective: Evidence from county-level governments in China. Heliyon, 10(17), e37267. https://doi.org/10.1016/j.heliyon.2024.e37267

Hasib, N., Abbas Rizvi, S. W., & Katiyar, V. (2023). Risk Mitigation and Monitoring Challenges in Software Organizations: A Morphological Analysis. International Journal on Recent and Innovation Trends in Computing and Communication, 11(8), 172–185. https://doi.org/10.17762/ijritcc.v11i8.7943

Hassan, I. U., & Asghar, S. (2021). A framework of software project scope definition elements: An ism-dematel approach. IEEE Access, 9, 26839–26870. https://doi.org/10.1109/ACCESS.2021.3057099

Hung, B. Q., Hoa, T. A., Hoai, T. T., & Nguyen, N. P. (2023). Advancement of cloud-based accounting effectiveness, decision-making quality, and firm performance through digital transformation and digital leadership: Empirical evidence from Vietnam. Heliyon, 9(6), e16929. https://doi.org/10.1016/j.heliyon.2023.e16929

Khalfan, M., Azizi, N., Haass, O., Maqsood, T., & Ahmed, I. (2022). Blockchain Technology: Potential Applications for Public Sector E-Procurement and Project Management. Sustainability (Switzerland), 14(10). https://doi.org/10.3390/su14105791

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., &Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. SAGE Open, 11(3), 215824402110475. https://doi.org/10.1177/21582440211047576

Kusumawardhana, R. H., Eitiveni, I., Yaziji, W., &Adriani, Z. A. (2024). Identifying Critical Success Factors (CSF) in ERP Implementation Using AHP: A Case Study of a Social Insurance Company in Indonesia. Journal of Cases on Information Technology, 26(1). https://doi.org/10.4018/JCIT.337389

Lugonja, D. (2018). ERP implementation and interoperability growth as organization improvement agents in public administration further development. Journal of Information and Organizational Sciences, 42(1), 111–146. https://doi.org/10.31341/jios.42.1.6

Malik, A. W., Bhatti, D. S., Park, T.-J., Ishtiaq, H. U., Ryou, J.-C., & Kim, K.-I. (2024). Cloud Digital Forensics: Beyond Tools, Techniques, and Challenges. Sensors, 24(2), 433. https://doi.org/10.3390/s24020433

Mandičák, T., Mésároš, P., Kanáliková, A., &Špak, M. (2021). Supply chain management and big data concept effects on economic sustainability of building design and project planning. Applied Sciences (Switzerland), 11(23). https://doi.org/10.3390/app112311512

Marnewick, C., &Marnewick, A. L. (2022). Digitalization of project management: Opportunities in research and practice. Project Leadership and Society, 3, 100061. https://doi.org/10.1016/j.plas.2022.100061

Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., Félix, R. A., & Mena, L. J. (2023). Role of Digital Transformation for Achieving Sustainability: Mediated Role of Stakeholders, Key Capabilities, and Technology. Sustainability, 15(14), 11221. https://doi.org/10.3390/su151411221

Mukred, M., Yusof, Z. M., Asma' Mokhtar, U., Sadiq, A. S., Hawash, B., & Ahmed, W. A. (2021). Improving the decision-making process in the higher learning institutions via electronic records management system adoption. KSII Transactions on Internet and Information Systems, 15(1), 90–113. https://doi.org/10.3837/TIIS.2021.01.006

Müller, L. S., Nohe, C., Reiners, S., Becker, J., &Hertel, G. (2024). Adopting information systems at work: a longitudinal examination of trust dynamics, antecedents, and outcomes. Behaviour and Information Technology, 43(6), 1096–1128. https://doi.org/10.1080/0144929X.2023.2196598

Nadkarni, S., &Prügl, R. (2021). Digital transformation: a review, synthesis and opportunities for future research. Management Review Quarterly, 71(2), 233–341. https://doi.org/10.1007/s11301-020-00185-7

Owolabi, H. A., Oyedele, A. A., Oyedele, L., Alaka, H., Olawale, O., Aju, O., Akanbi, L., &Ganiyu, S. (2024). Big data innovation and implementation in projects teams: towards a SEM approach to conflict prevention. Information Technology and People. https://doi.org/10.1108/ITP-06-2019-0286

Romero Izurieta, R., Toapanta Toapanta, S. M., Caucha Morales, L. J., Hifóng, M. M. B., Gómez Díaz, E. Z., Mafla Gallegos, L. E., Maciel Arellano, M. R., & Orizaga Trejo, J. A. (2022). Model to Optimize the Management of Strategic Projects Using Genetic Algorithms in a Public Organization. Information (Switzerland), 13(11). https://doi.org/10.3390/info13110533

Salas-Tanchiva, C. C. (2022). Repercusión e importancia de la automatización del trámite documentario en las instituciones públicas. Revista Científica de Sistemas e Informática, 2(1), e266. https://doi.org/10.51252/rcsi.v2i1.266

Soveizi, N., Turkmen, F., &Karastoyanova, D. (2023). Security and privacy concerns in cloud-based scientific and business workflows: A systematic review. Future Generation Computer Systems, 148, 184–200.

https://doi.org/10.1016/j.future.2023.05.015

Taboada, I., Daneshpajouh, A., Toledo, N., & de Vass, T. (2023). Artificial Intelligence Enabled Project Management: A Systematic Literature Review. Applied Sciences, 13(8), 5014. https://doi.org/10.3390/app13085014

Thomas, B. J., &Alkhafaji, S. (2020). Business intelligence tools and team performance of oil and gas industries. Journal of Advanced Research in Dynamical and Control Systems, 12(4 Special), 1045–1059. https://doi.org/10.5373/JARDCS/V12SP4/20201578

Uren, V., & Edwards, J. S. (2023). Technology readiness and the organizational journey towards AI adoption: An empirical study. International Journal of Information Management, 68. https://doi.org/10.1016/j.ijinfomgt.2022.102588

Van Veldhoven, Z., & Vanthienen, J. (2022). Digital transformation as an interaction-driven perspective between business, society, and technology. Electronic Markets, 32(2), 629–644. https://doi.org/10.1007/s12525-021-00464-5

Yaghubi, D., Doroodian, M., &Adibi, M. A. (2023). Development of a Financing Optimization Framework Based on Risk Simulation in BOT Projects: A Case Study of the Waste-to-Energy Project. Complexity, 2023. https://doi.org/10.1155/2023/8129256

Zahid, R., Altaf, A., Ahmad, T., Iqbal, F., Vera, Y. A. M., Flores, M. A. L., & Ashraf, I. (2023). Secure Data Management Life Cycle for Government Big-Data Ecosystem: Design and Development Perspective. Systems, 11(8), 380. https://doi.org/10.3390/systems11080380

Zaleski, S., & Michalski, R. (2021). Success factors in sustainable management of it service projects: Exploratory factor analysis. Sustainability (Switzerland), 13(8). https://doi.org/10.3390/su13084457

ZareKhafri, A., Sheikh Aboumasoudi, A., &Khademolqorani, S. (2023). The Effect of Innovation on the Company's Performance in Small and Medium-Sized Businesses with the Mediating Role of Lean: Agile Project Management Office (LAPMO). Complexity, 2023. https://doi.org/10.1155/2023/4820636

Zhao, Y., & Jensen, H. (2022). Towards a Modern Learning Organization: Human-Centered Digitalization of Lessons Learned Management for Complex Systems Development Projects. Technologies, 10(6). https://doi.org/10.3390/technologies10060117