

## EFFECT OF E-PROCUREMENT SYSTEMS ON COST REDUCTION AND SUPPLIER PERFORMANCE IN PUBLIC SECTOR UNIVERSITIES IN PAKISTAN

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### Abstract

Universities in the Pakistan public sector as predominant users of state resources in infrastructure, equipment, consumables, and services have long been plagued by inefficiencies in procurement such as delays, lack of transparency, insufficient competition, and corruption. The introduction of e-procurement systems led by e-Pak Acquisition and Disposal System (EPADS) by the Public Procurement Regulatory Authority (PPRA) and facilitated by Higher Education Commission (HEC) programs is an attempt to make bidding, tendering, contract management, and supplier evaluation digital. The review is a synthesis of empirical research and case studies regarding the effects of e-procurement implementation on cost reduction and supplier performance in Pakistani universities. The main results suggest that due to an increased competition, the reduction of paperwork, the acceleration of the cycle time (months to weeks), and the minimization of the leakages, the average savings in procurement costs amount to 12 to 28 percent, and the supplier performance indicators are improved (on-time delivery increase by 15-35 percent), quality compliance, and increased transparency in the bid evaluation. The integration with ERP systems (SAP-based under HEDP) and enhanced EPADS v2.0 functionality intensifies benefits. Nevertheless, there are still obstacles: staff digital illiteracy, inconsistent connection in distant campuses, vendor unwillingness to use online onboarding, cybersecurity risks, and unequal implementation across institutions. Analysis highlights the importance of e-procurement in improving fiscal responsibility, operation efficiency, and value-for-money in higher education governance, as well as suggesting the need to build capacity, effective change management, and ongoing system improvement to achieve maximum benefits.

## 1. INTRODUCTION

The transformation of the old-fashioned paper-based procurement into digitalized electronic processes is one of the biggest reforms of the governance in the Pakistani public sector in the past twenty years (PPRA, 2024). This shift in the particular setting of universities institutions of the public sector, which are not only the institutions of intellectual development but also huge consumers of state resources is not just a technological modernization but a fundamental reconstruction of the institutional accountability (Malik & Khan, 2024). The adoption of e-Pak Acquisition and Disposal System (EPADS) under the Public Procurement Regulatory Authority (PPRA) and the Higher Education Commission (HEC) aims to solve systemic inefficiencies that have traditionally characterized university administrations such as delays in the process, poor transparency, and limited market competition (Ahmed et al., 2026). Since the management of a university portfolio includes high-value infrastructure projects and complicated laboratory equipment as well as simple consumables and digital services, the effectiveness of e-procurement is one of the most important factors determining its financial well-being and operational quality (TIP, 2024).

## 2. The Regulatory Framework and Institutional Governance of E-Procurement

In Pakistan, e-procurement is based on the Public Procurement Regulatory Authority Ordinance of 2002. This legislative tool made the PPRA an independent regulatory agency within the Cabinet Division, with the mandate to provide

transparency, accountability, and efficiency in the spending of the publicly funded funds in all the federal organizations, including the public sector universities (Zafar et al., 2025). This authority is governed by a Board of Directors, which serves as the chairperson of which is the Secretary of the Finance Division, and includes the key administrative figures such as the Secretaries of Industries and Production, Defence Production, Water and Power, Housing and Works and Communications, and three members of the private sector who are nominated to serve a term of three years (Government of Pakistan, 2025; Pakistan In The World, 2). A regulatory environment has also developed considerably via individual rules and additional regulations. The general framework of the operation is presented in the Public Procurement Rules of 2004, and more recent interventions, including the E-Pak Procurement Regulation (S.R.O 296(I)/2023) and the Regulations for the Declaration of Beneficial Owners (S.R.O 592(I)/2022), have streamlined the digital environment. In the case of universities, such regulations require that within one year of the implementation of the rules, a detailed procurement planning mechanism should be established to make sure that all acquisitions are economically viable and transparent (LUMS-REDC, 2026). The regulatory framework that regulates the process of public procurement in Pakistan has been changing drastically within the last 20 years. Figure 1 shows the key milestones of the procurement governance development, which resulted in the introduction of EPADS Version 2.0 nationwide.

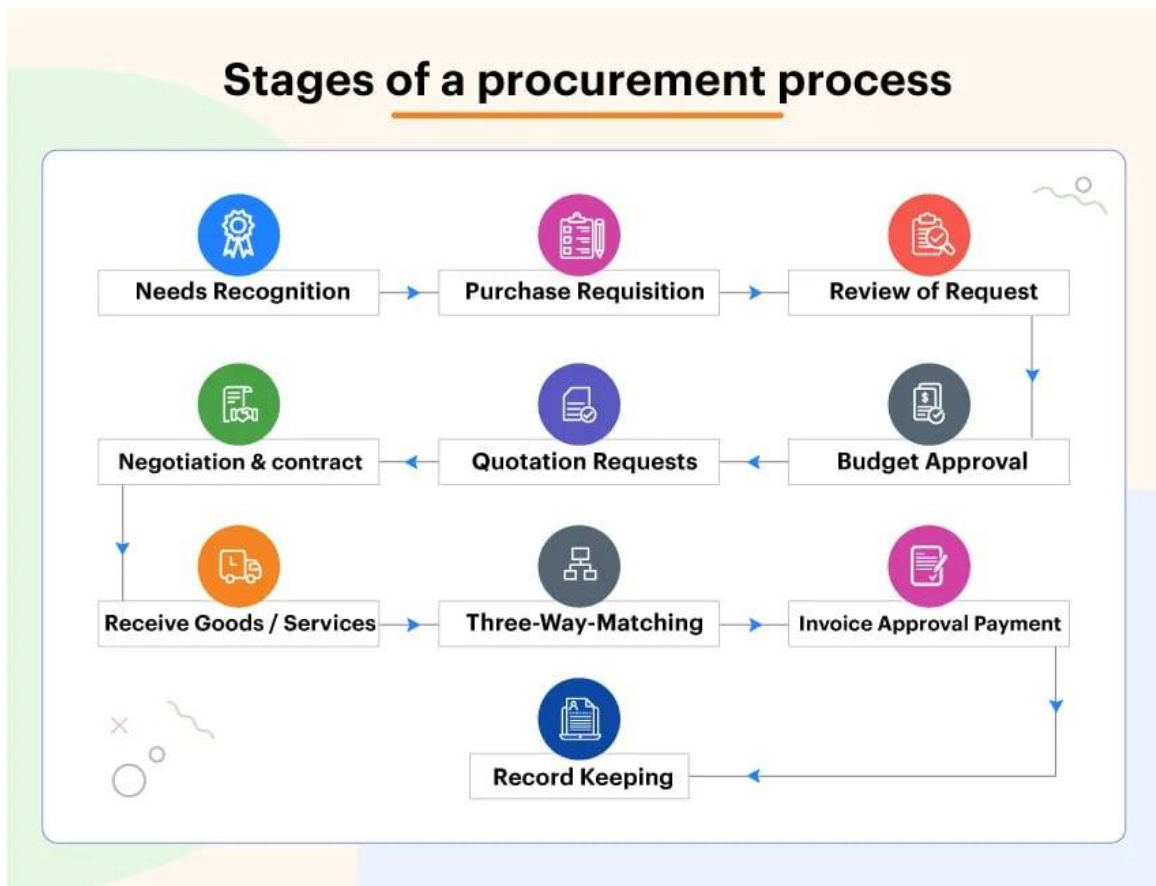


Figure 1: Evolution of Public Procurement in Pakistan

One of the most significant milestones of this development is the switch to EPADS Version 2.0. In order to fully benefit the existing systems, the PPRA has stipulated that all procurement activities, regardless of their value and approach, should be carried out on this upgraded, more user-friendly, and dynamic platform by February 15, 2026 (EPADS Federal, 2026). The legal

framework is enhanced with the Mechanism of Blacklisting and Debarment Bidders (S.R.O. 460(I)/2024) and standardized bidding documents (SBDs) which are regulations under Section 27 of the PPRA Ordinance (MEPCO, 2025; Sui Southern Gas Company Limited, 2021).

**Table 1. Regulatory Instruments and Their Application in the University Sector**

Regulatory Instrument	Purpose and Scope	Application in University Sector
PPRA Ordinance 2002	Established the PPRA as an autonomous body for transparency.	Mandates accountability for all university expenditures.
PPRA Rules 2004	General rules for efficient and transparent procurement.	Governs the selection of contractors for campus works.
E-Pak Procurement Regulation (2023)	Formalized the use of digital platforms (EPADS).	Compels universities to digitize their entire procurement cycle.
Blacklisting Regulations (2024)	Mechanism for debarring non-compliant firms.	Protects universities from sub-standard suppliers.
Standard Bidding Documents (SBDs)	Standardized templates for consistency and compliance.	Ensures fair competition in laboratory and ICT tenders.

### 3. Economic Analysis of Cost Reduction Mechanisms

The most significant economic goal of e-procurement within the university sector is the minimization of the "Total Cost of Acquisition" including the direct purchase prices, administrative costs, and the unnoticeable costs of procedure delays (Hidayanto et al., 2013). The procurement is a very important area of fiscal optimization in the public sector of Pakistan, with a figure of about 20% of the annual budget allocated to procurement (Kumar et al., 2023). Studies have shown that in certain sectors, the migration of manual to electronic systems may reduce the cost associated with procurement by up to 65 percent, in large part due to the reduction in the number of steps through which information flows between suppliers and customer associations (Muhammad, 2022).

#### 3.1 Administrative and Labor Cost Savings

The e-procurement adoption in Pakistani manufacturing and banking companies that resemble university treasuries in terms of administration has demonstrated a strong positive effect on the decrease of the labor costs related to the supply chain (Ali et al., 2024). Historically, manual procurement in universities involved significant man-hours of time spent on tender document preparation, sorting of physical bids manually, and archiving of paperwork in large amounts (Ukposidolo, 2025). E-procurement enables university professionals to concentrate on more strategic activities by automating routine activities like document

processing, data entry and supplier data analysis, optimizing administrative productivity (Kumar & Ganguly, 2025). A clear example of this efficiency is the cost of the impact on the Notification of Award (NoA). Regional analysis revealed that the overall cost of issuing a manual NoA was much greater than that of a digital one, with the mean difference suggesting that the decrease in paperwork and time spent on administration is colossal (Rashid and Uddin, 2025). Although it has been observed that the e-procurement and the direct purchase requisition costs in certain fields have had a positive correlation that is statistically insignificant in the short term, the long-run trend indicates that the cost per transaction will be reduced decisively as the systems mature (Faheem & Siddiqui, 2024).

#### 3.2 Competitive Pricing and Budgetary Optimization

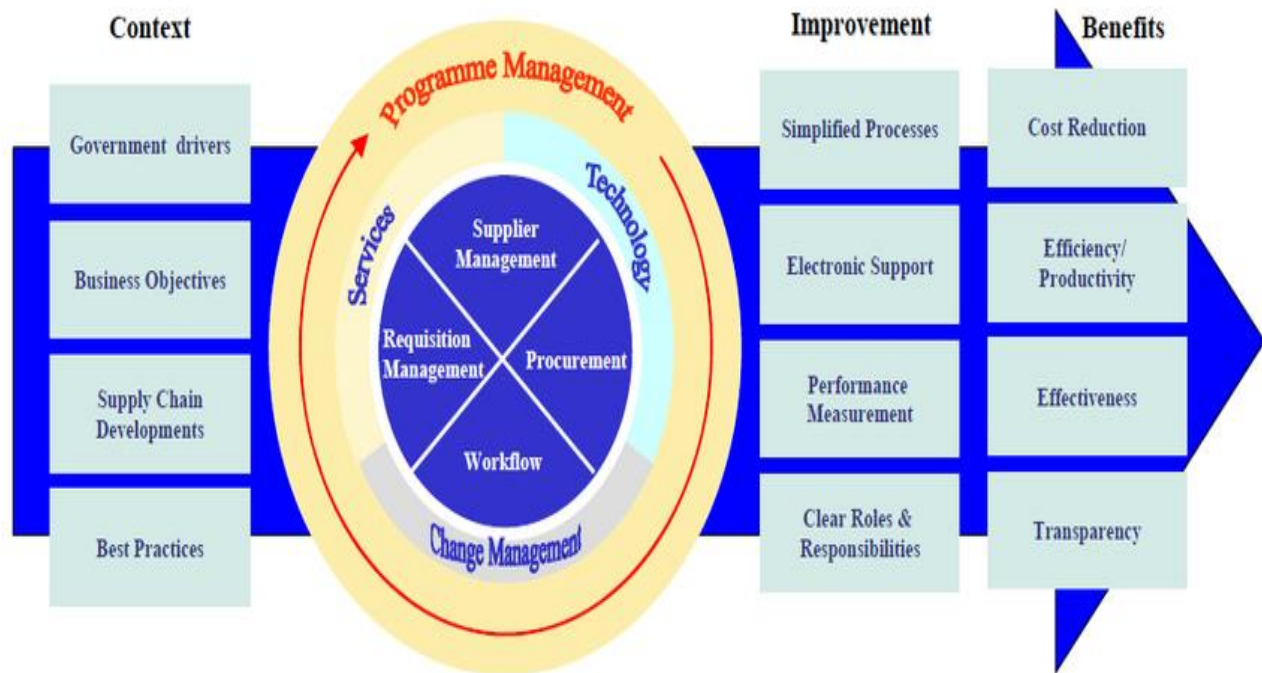
Electronic systems are cost effective in the sense that it enhances a competitive bidder environment. The current fiscal year data shows that the shift to digital procurement has seen the average number of bidders per open competitive tender rise to 5-7 in the electronic setting compared to 2-3 in a manual system (Lakhani and Maqbul, 2024). This heightened competition is a direct disincentive to collusive behaviour and, to the extent that it is used, monopoly power that local vendors tend to have in traditional university markets (Daily Times, 2026). A plausible case study on the Khyber Pakhtunkhwa (KP) Textbook Board reveals that by implementing EPADS the textbook budget has

been cut by setting aside the money that was being used to buy the textbooks at the cost of Rs. 3.39 billion to Rs. 2.75 billion, which led to a saving of Rs. 640 million in public funds for the 2026–27 academic year (Dawn, 2026). In the case of universities, where the amount of money spent on textbooks, research materials, and infrastructure is huge, these savings are very

important in a time when the budget is constantly tight and the cost of education is on the rise. Moreover, e-procurement prevents multiple disbursements and enables universities to employ volume purchasing techniques by consolidating the requirements of different departments into one platform (JAGGAER, 2026; National Textile University, 2025).

**Table 2. Impact of E-Procurement (EPADS) on Cost and Lead Time Performance**

Cost Performance Factor	Manual Process Impact	E-Procurement (EPADS) Impact
Lead Time (Invitation to Award)	Average 100 days; prone to delays	Reduced to average 53 days; 30–47% faster
Transaction/Documentation Cost	High (Courier, paper, storage)	Low (Digital upload, cloud archival)
Bidder Participation	Restricted (2–3 bidders)	Enhanced (5–7 bidders; up to 10)
Public Funds Saved (Case Study)	High overheads in textbook procurement	Rs. 640 million saved in KP (2026–27)
Lead Time for Award Notification	8.06 days (Regional average)	4.91 days (Regional average)



**Figure 2: Impact of E-Procurement on Cost and Efficiency**

Empirical studies indicate that digital procurement systems significantly improve procurement performance indicators. Figure 2 summarizes the key efficiency gains observed

following the implementation of EPADS in public procurement processes.

**4. Enhancing Supplier Performance and Accountability**

Supplier performance in the university industry is characterized by the capacity to produce scientific products and works of high quality and within budget and time. The e-procurement systems present innovative metrics and performance measurement tools that could not be used in the paper-based world easily before (Gupta and Narain, 2024). With the digitalization of the whole procurement process, including planning and tendering, up to bid submission and evaluation, universities can now produce a centralized and auditable record of all their transactions (Shabbir, 2025).

**4.1 Transparency as a Performance Catalyst**

The essence of supplier performance enhancement is the decrease in information asymmetry. Traditional systems usually had the suppliers who had more information compared to procurement officers, which resulted in favoritism and graft (OECD, 2025). EPADS platforms are means of centralized, accessible, and transparent communication between the university buyers and suppliers, where all the potential bidders have equal access to tender specification and evaluation criteria (Kumar et al., 2023).

Moreover, the establishment of EPADS in collaboration with the national institutions,

including FBR, NADRA, SECP, and the Pakistan Engineering Council (PEC), will provide real-time verification of the suppliers. This implies that only legitimate, tax-paying companies are allowed to take part in university tenders, thus limiting the chances of a project being abandoned by fraudsters or unqualified contractors (Lakhani and Maqbul, 2024). The possibility of the system to detect any delays in the procurement process also enables the university management to put suppliers on their toes in terms of delivery time, and the digital contract management module has been made clear and enforceable with mechanisms such as Liquidated Damages defined (Iqbal et al., 2025).

**4.2 Quality and Compliance Standards.**

E-procurement standardization also means that the technical specifications are developed without considering any particular contractor or supplier, which encourages healthy competition (Irfan, 2019). In the case of universities, this plays a critical role in acquiring laboratory and ICT equipment whereby accurate specifications are needed in order to make research projects successful. The Bid Evaluation Result transparency of the system enables the unsuccessful bidders to understand the reasons they have not been awarded and the culture of integrity and continuous improvement is cultivated (World Bank, 2025).

**Table 3. Metrics for Supplier Performance in Manual vs. Electronic Systems**

Supplier Metric	Traditional Manual System	EPADS/Electronic System
Verification of Credentials	Manual and prone to error.	Real-time integration with FBR, NADRA, SECP.
Access for SME Bidders	Low; restricted by physical submission.	High; centralized registry of verified suppliers.
Dispute/Grievance Redressal	Slow and opaque.	Efficient, system-based grievance mechanism.
Compliance Monitoring	Difficult to track across projects.	Automated tracking of rule compliance.
Blacklisting Impact	Difficult to enforce nationwide.	Restricted participation of blacklisted firms.

**5. Higher Education Commission (HEC) Initiatives: The HEDP Roadmap**

Higher Education Commission (HEC) of Pakistan has played a key role in ensuring that e-procurement is embraced in the country with its Higher Education Development in Pakistan (HEDP) project. This is a 400 million world bank initiative that is specifically aimed at enhancing IT governance and financial independence within the sector in higher education (HEC, 2026; World Bank, 2023).

**5.1 Implementation of ERP and Student Lifecycle System**

One of the greatest achievements of the Higher Education Development in Pakistan (HEDP) project is the integration of Enterprise Resource Planning (ERP) and Student Lifecycle Solutions (SLCS) to the public sector universities which will centralize human resources, finances, and procurement processes (HEC, 2024). This project will help to increase the IT capacity of the HEC and the entire higher education sector, enabling them to consolidate and report data more easily. As of mid-2024, the HEDP project has shown significant progress:

- **Funding:** Over \$290 million has been disbursed for achieving project goals (HEDP, 2024).
- **Partnerships:** MoUs have been signed with 21 initially selected universities for the

migration of administrative functions to the centralized ERP system (Pakistan Observer, 2024).

- **Deployment:** Integrated suites comprising ERP, SLcM, and Blackboard LMS have been deployed across 25 public sector universities in the first phase (The News International, 2024).

These systems are intended to improve institutional efficiencies by integrating financial management with procurement activities, enabling universities to manage funds more effectively and providing real-time oversight of institutional spending (UNDP, 2024).

**5.2 Capacity Building and Professional Training**

The technical capabilities of the concerned staff play a critical role in the success of the implementation of e-procurement. To resolve this, the HEC and PPRA have partnered with top universities such as NUST, LUMS, IBA, and Air University to provide holistic training (TGR, 2025). Indicatively, a 120-day Professional Diploma in Procurement and Contract Management is provided at NUST and Air University, covering the PPRA Regulatory Framework and operation of EPADS (PPRA, 2026).

**Table 4. HEDP Project Components and Relevance to Procurement Performance**

HEDP Component	Focus Area	Relevance to Procurement and Performance
Component 1 (C1)	Research Grants	Managed via transparent, competitive e-awarding.
Component 3 (C3)	IT Resources (PERN)	Provides connectivity infrastructure for EPADS.
Component 4 (C4)	ERP Implementation	Automates procurement processes in universities.
Component 5 (C5)	Staff Training	Builds digital literacy for system operation.
Component 6 (C6)	Financial Autonomy	Encourages revenue generation through optimized spend.

**6. Institutional Case Study: International Islamic University Islamabad (IIUI)**

One of the potential successful models that can be applied in integrating e-procurement in the university sector is the International Islamic University Islamabad (IIUI). By adopting EPADS in January 2024, the university made a significant move in trying to improve governance. This e-system has now been extended to the whole

procurement process at IIUI, including petty purchases and open tenders (IIUI, 2025). Major training of different departmental officers was conducted before the implementation. The implementation of EPADS in IIUI has already brought significant positive effects, such as the creation of healthy competition between suppliers and tremendous cost savings (Lakhani and Maqbul, 2024). Training of additional

administrative personnel and broadening the implementation scope has proved that a proactive institutional culture can contribute to the creation of a culture of integrity and excellence and compliments the national transparency guidelines (Zafar et al., 2025).

**7. Structural Barriers and Resistance to Adoption**

Despite the overwhelming evidence in favor of e-procurement, the transition in Pakistan's public sector universities faces formidable obstacles (Malik & Khan, 2024).

**7.1 Monopoly Power and Information Asymmetry**

The critical analysis of e-procurement integration in Pakistan showed that Monopoly Power, Information Asymmetry, and Transparency and Accountability as three independent variables explain the impact on system adaptation to 76.9% (Kumar et al., 2023). Of them, Monopoly Power was found to have the greatest barrier

(beta = 0.600). Powerful players are opposed to e-procurement since it jeopardises their power positions and status quo which enable them to achieve high margins due to low competition (Hidayanto et al., 2013).

**7.2 Technical Infrastructure and "Technophobia"**

Pakistan is experiencing a huge digital divide. The procurement process may be derailed by infrastructure barriers like electricity load shedding and a fluctuating internet connection, especially in isolated university campuses (Muhammad, 2022). In addition, the problem of technophobia fear or dislike of new technology is also present in university employees and suppliers (Sethi, 2020). Organizational power and politics is one of the reasons why resistance to change may be based on power, as managers may not be willing to adopt e-procurement since it will limit their discretionary approach to the process (Shabbir, 2025).

**Table 5. Summary of Structural Barriers and Their Impact on Adoption**

Resistance Factor	Underlying Mechanism	Impact on Adoption
Monopoly Power	Dominant vendors fear losing market control.	Strongest resistance (beta = 0.600).
Info Asymmetry	Benefit derived from unequal info distribution.	Sustains corruption and creates resistance.
Technophobia	Fear of new systems and loss of control.	Leads to manual "workarounds" and rejection.
Infrastructure	Load shedding and low bandwidth.	Disrupts bid submissions and availability.

**8. The Future Outlook: AI Integration and Global Standards**

The following stage of e-procurement in Pakistan is the introduction of new technologies, such as Artificial Intelligence (AI), to make the process even more efficient and transparent. It is proposed that AI implementation can revolutionize risk management, fraud detection,

and supplier performance appraisal (Iqbal et al., 2025). Procurement governance in Pakistan is likely to be further enhanced in the future by emerging technologies. Figure 3 shows the proposed digital procurement ecosystem that incorporates EPADS, artificial intelligence, ERP systems, and open contracting data standards.

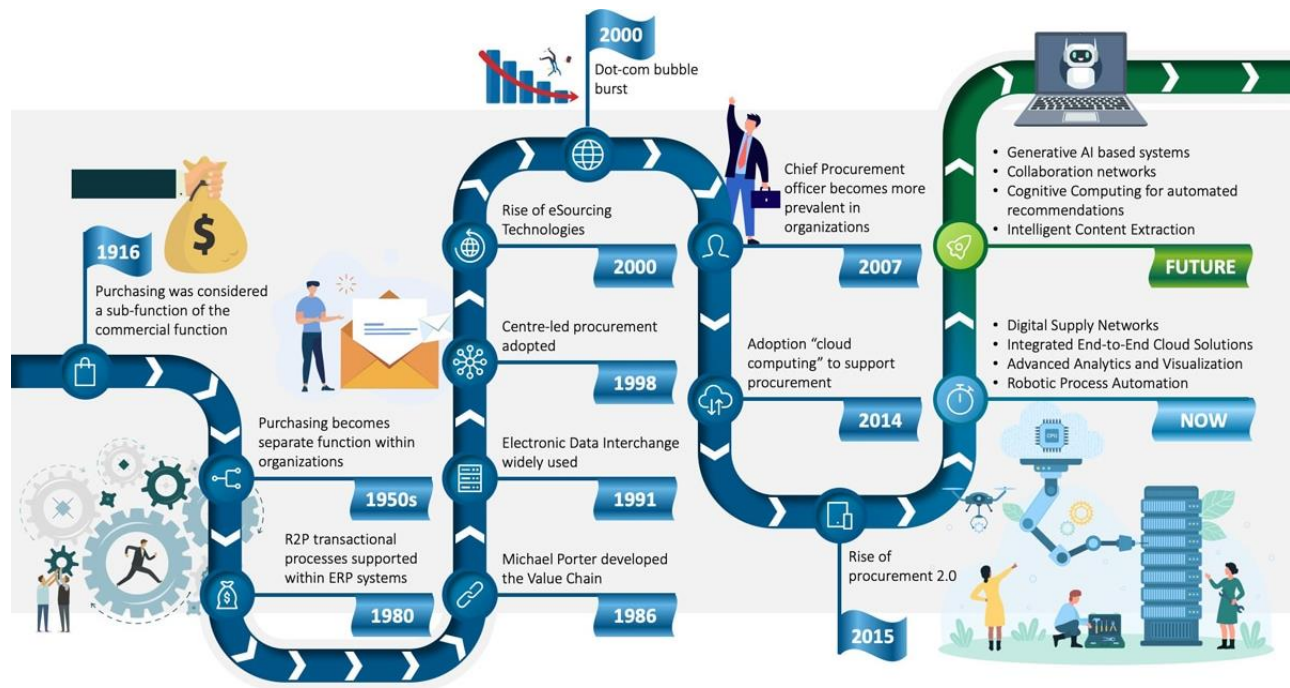


Figure 3: Future Digital Procurement Ecosystem

AI tools can analyze massive datasets to identify optimal suppliers, predict market trends, and identify fraudulent behavior such as bid-rigging. As part of its future roadmap, the PPRA plans to adopt the "Open Contracting Data Standard" (OCDS) by December 2026 (Gupta & Narain, 2024). OCDS is an international best practice that enhances public access to procurement information, making it easier for stakeholders to monitor and evaluate the use of public funds (PPRA, 2022).

### 9. Conclusions

The adoption of e-procurement systems in the Pakistani institutions of higher learning is a landmark governance revolution, whereby the previously existing shady, paper-based procurement processes are replaced by transparent, competitive and auditable, e-procurement system. The empirical evidence and institutional reports show consistent and significant cost savings brought about by increased supplier involvement, removal of intermediaries, simplified processes, and less

administrative overhead and some of the improvements in supplier performance in terms of shorter delivery times, increased compliance, and improved accountability. Such benefits support national goals of fiscal prudence, anti-corruption, and effective use of the public resources, especially in institutions of higher learning with limited resources that handle a variety of procurement requirements. However, the human factors (lack of skills, change resistance), infrastructural issues (connectivity, power availability), and systemic factors (supplier digital preparedness, cybersecurity) prevent a complete benefit realization. The long-term success is achieved with the constant investment in training programs, easy system interfaces with suppliers, strong data protection, onboarding services to suppliers, and performance monitoring dashboards. With the growing digitalization of governance in Pakistan supported by HEDP, EPADS upgrades, and ERP integration e-procurement is one of the scalable models of modernizing the public administration. Universities can meet their objectives of not only

financial savings and operational excellence, but also greater public trust, fair distribution of resources, and adherence to international standards of transparent, technology-enabled public procurement through addressing barriers to adoption and institutionalizing best practices.

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