Digital Bidding: A Systematic Evaluation of Electronic Reverse Auction Adoption in Philippine Construction Procurement Management

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ABSTRACT

Electronic Reverse Auctions (eRAs) are emerging as a modern procurement method in the Philippine construction industry, supported by providers with experience across major construction firms, universities, real estate developers, and project management organizations. Research shows that eRAs deliver greater cost efficiency and transparency than traditional sealed bidding, while reducing opportunities for corruption through third-party facilitation. Despite these advantages, the sector continues to rely on manual, paper-based processes that lack real-time price competition, consistent auditability, and standardized digital procurement guidelines.

This study examines the application of eRAs in construction management and develops guidelines to help industry stakeholders better understand and adopt this method Through interviews and surveys; key themes and implementation factors will be identified and organized into a structured framework. The findings aim to fill existing gaps in procurement practice and promote wider use of eRAs to enhance efficiency, transparency, and fairness in the Philippine construction sector.

Keywords: Digital, Bidding, Electronic Reverse Auctions, Procurement Management, Evaluation

INTRODUCTION

Procurement inefficiencies continue to challenge the Philippine construction industry, where traditional methods often lead to high costs, delays, and lack of transparency. As a response, Electronic Reverse Auctions (eRAs) offer a promising digital solution that enhances competition and reduces procurement costs by allowing suppliers to bid in real time, with visibility into competing offers (Hanák et al, 2020). Traditional auction, buyers compete against each other to purchase an item or service from a seller for higher price. In eRAs, the roles of buyer and seller are reversed buyers solicit bids for specific goods or services, and suppliers compete to offer the lowest price. The winner is the someone who prepared to accept the lowest amount. (General Services Administration, 2024). Unlike traditional online auctions that award the item to the highest bidder at the end of a fixed time, platforms like eBay and uBid follow a timed format where all bids close at the same scheduled end.

Globally, eRAs have gained traction across sectors such as manufacturing, healthcare, and transportation, and have demonstrated benefits such as cost savings, increased transparency, and operational efficiency. During COVID-19 restrictions, traditional dealers faced on-site challenges and shifted to online auctions to boost declining sales (Media release 2020). Despite the complexity of business transactions, sellers and buyers can reach mutually beneficial agreements that streamline the transaction process (Tsai et al., 2011). In construction, eRAs can facilitate dynamic bidding for standardized, low-risk procurement packages, contributing to better value for money. In the Philippines, however, adoption of eRAs in construction remains limited, despite some early use by leading developers, contractors, construction managers service provider and institutions via third party platforms based in Makati. While eRAs present clear advantages, their implementation in construction brings specific challenges. These include determining project suitability, managing ethical concerns like bid manipulation, understanding bidder behavior, and ensuring long-term quality outcomes. For instance, complex

or high-value projects requiring sustained buyer supplier relationships may not be ideal for eRAs use (AlAsmakh 2021). Moreover, without clear guidelines, eRAs risk undermining trust, encouraging predatory pricing, and compromising construction quality. Given these concerns and the sector's growing interest in digital procurement, this study examines how eRAs operate within various construction trades and services in the Philippines. It seeks to assess whether eRAs provide an effective and ethical solution for procurement inefficiencies, especially in contexts where multiple suppliers offer similar services. Ultimately, the study aims to develop practical guidelines for responsible and strategic eRAs use in the local construction sector.

METHODOLOGY

Research Design

Mixed-methods approach combining quantitative (structured surveys) and qualitative (interviews) methods. Focus on adoption of electronic reverse auctions (eRA) in Philippine construction procurement. This method was chosen because eRA adoption involves technological, organizational, and institutional factors. Enables data triangulation for enhanced validity.

Tradition of Inquiry & Data Collection

Data will be collected through online surveys and semi-structured interviews with professionals involved in eRA-based procurement, providing both quantitative measures of effectiveness and qualitative insights into user experiences. Case studies of organizations currently implementing eRAs will offer deeper contextual understanding of real-world practices. A cross-case analysis will then be conducted to compare results across different settings, enabling the identification of common success factors, operational challenges, and barriers to adoption. This analytical process ensures that findings are validated through multiple evidence sources and remain directly relevant to industry needs, ultimately strengthening the study's ability to evaluate the effectiveness of eRAs and propose practical, evidence-based recommendations.

Sources of Data

Primary data were collected from targeted professionals via surveys and interviews. With the respondent categories as follows: Procurement Officials & Managers: 3+ years' experience, manage bids/electronic reverse auctions, Licensed Contractors & Bidders: PCAB license, and have a eRAs participation, Project Engineers & Quantity Surveyors: 2+ years' experience, familiar with procurement platforms, ICT & E-Procurement

Developers: Experts in system architecture and integration Government Regulators & Policy Experts: From GPPB, DPWH, DOTr, LGUs; involved in policy development/enforcement. Secondary data, literature review from databases (Scopus, ScienceDirect, IEEE Xplore, SpringerLink, Google Scholar) covering 2015–2025.

Instrumentation

Data Collection Tools: Interviews and Google Forms surveys. Quantitative Analysis: Uses mean analysis to identify trends and compare datasets. Qualitative Analysis: Applies content analysis to literature, categorizing textual data and identifying keyword frequency to extract meaningful insights.

Ethical Considerations

Voluntary Participation in all participants are informed that involvement is optional, and they may withdraw at any time without consequences. That data will be handled with strict confidentiality; participants can request data withdrawal post-submission. Academic integrity of the final manuscript will be checked for originality using Turnitin plagiarism detection software.

RESULTS AND DISCUSSION

The study integrates literature, theory, and empirical data to analyze the adoption of Electronic Reverse Auctions (eRA) using TAM3, Institutional Theory, and the Resource-Based View (RBV).

Adoption Drivers

The key motivators for eRAs adoption are cost savings, efficiency, transparency, and compliance with digital governance. Survey results respondents generally agreed on the benefits of eRAs across demographics (mean scores ~4.0). Reported benefits are:

- Cost savings: 5–10% of project cost.
- Time savings: 10–20% reduction in procurement time.
- Top feature: Real-time bidding. Adoption Barriers

The challenges are limited IT infrastructure, resistance to change, lack of training, cybersecurity concerns.

Theoretical alignment:

- TAM3: Barriers relate to effort expectancy and behavioral control.
- RBV: Highlights the need for internal capabilities like digital skills and policy integration.

Institutional Pressures

Coercive pressures: Government mandates (e.g., Republic Act No. 12009) drive eRA adoption.

Normative pressures: Industry standards and professional norms encourage compliance.

Mimetic pressures: Organizations emulate successful peers.

Organizational Readiness

- Enablers: Digital maturity, IT support, leadership commitment, and process reengineering.
- Support measures: Training, manuals, and system integration improve user readiness and adoption success.

  Evolving User Acceptance

- Trends: Growing acceptance with improved training and support.
- TAM3 insights: Self-efficacy and external control shape user behavior.
- Post-auction priorities: Supplier performance, bid accuracy, transparency, and contractor capability.

Broader Implications

- Reflects the Philippine government's broader digital transformation agenda, integrating tech with governance and public service.
- Challenges include usability issues, lack of training, and resistance to change.

Implementation Plan:

- A structured, multi-dimensional plan is proposed to enhance eRA utilization, aligned with industry best practices. The proposed modernize procurement guidelines with supporting policy enhancements, offering decision-makers clear tools for evaluating and adopting eRAs, and providing practical steps to improve implementation. By addressing local challenges, promoting transparency and competitive digital bidding. The guidelines strengthen the effective use of eRAs in Philippine construction procurement.

CONCLUSION

The adoption of Electronic Reverse Auctions in Philippine construction procurement reflects both progress and persistent challenges. While the benefits of eRAs such as improved transparency, accountability, and procurement efficiency are widely acknowledged, the actual implementation is hindered by gaps in technical capacity, user readiness, and organizational integration. The study confirms that successful adoption requires not only robust digital systems but also effective leadership, sustained training, and institutional alignment.

Furthermore, the integration of theoretical models such as TAM3, Institutional Theory and RBV demonstrates that adoption is shaped by a combination of individual perceptions, organizational capabilities, and environmental pressures. For the Philippines to achieve scalable success with eRA systems, attention must be given to strengthening internal resources while aligning with implementation plan and best practices.

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